ptember 1960

Complete convention programs

AREA committee meetings

Exhibit in print

way TRACK and

STRUCTURES

ying welded rails

big line change

p. 42

A Simmons-Boardman TIME-SAVER Publication

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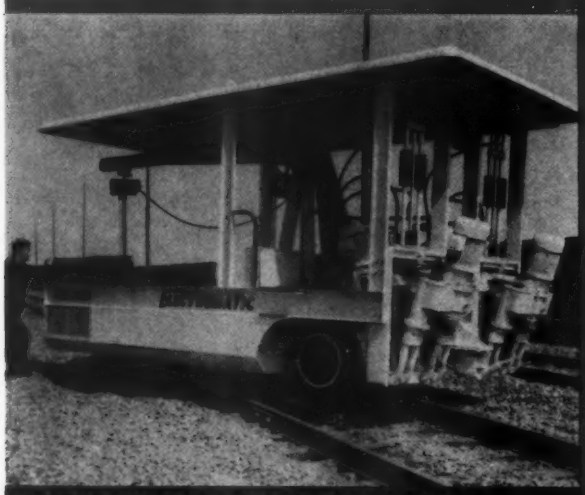

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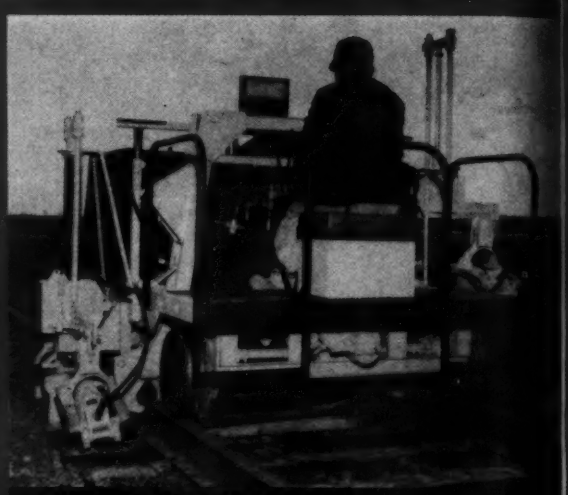

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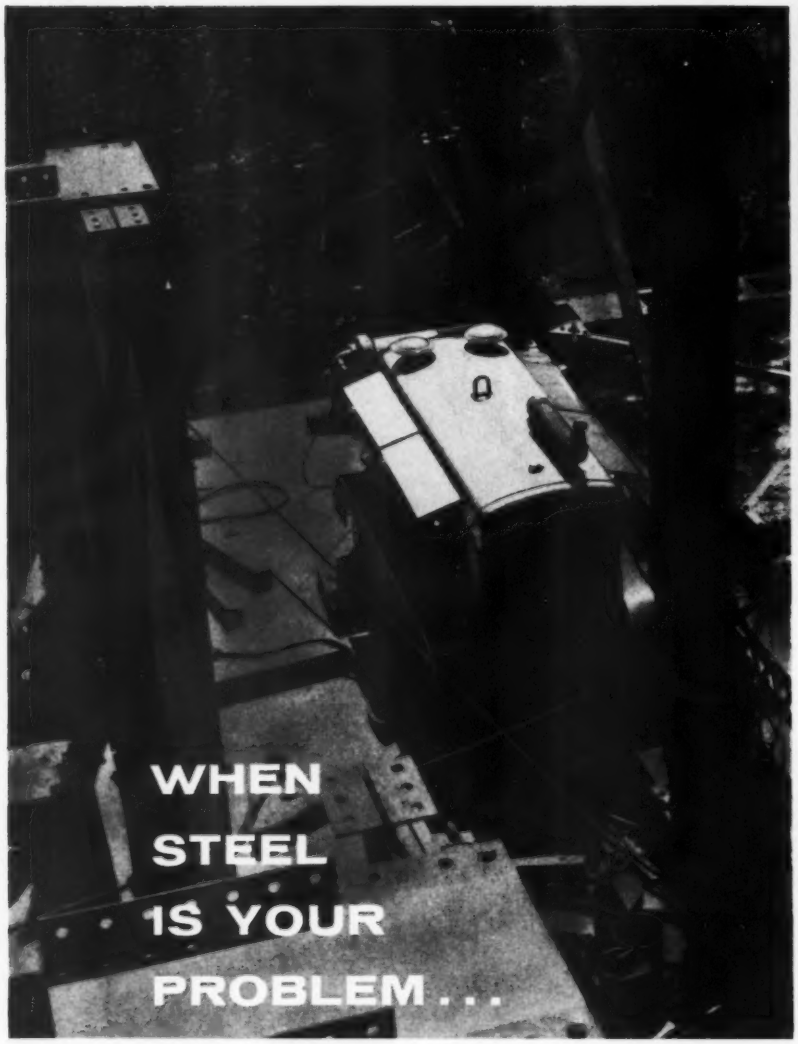
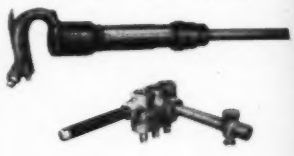


Left: CP-365 Compressor at work on bridge structure. Above: Running up nuts on structural steel with CP-612 Reversible Impact Wrench.

CP-411 Cement Chipper.



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Railway TRACK and STRUCTURES

SEPTEMBER

1960 • Vol. 56, No. 9

Progress report on concrete ties 33

AAR researchers give account of experience with two test sections that were installed on the ACL and the SAL in March this year.

Skates give way to retarders in hump yard 36

Describes a mechanical device for stopping cars at leaving ends of tracks, and gives account of experience with a particular installation.

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Gives complete details of Roadmasters' and B&B meetings to be held at Chicago, September 19-21; also lists AREA committee meetings.

More life from old timber approaches 40

Reports results of inspection made to determine effectiveness of preservative treatment applied in field to long trestles five years ago.

Laying long welded rails on big line change 42

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Puts rail-failure data on punch cards 45

C. J. Code tells how the Pennsylvania is using its IBM machine to tabulate rail-failure statistics, and describes benefits being realized.

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◀ Don't miss . . .

On-the-spot coverage of the Roadmasters' and Bridge & Building conventions while these meetings are still news. Pictures will show who was there and what they did; text will give highlights of reports and addresses.

. . . in the October issue

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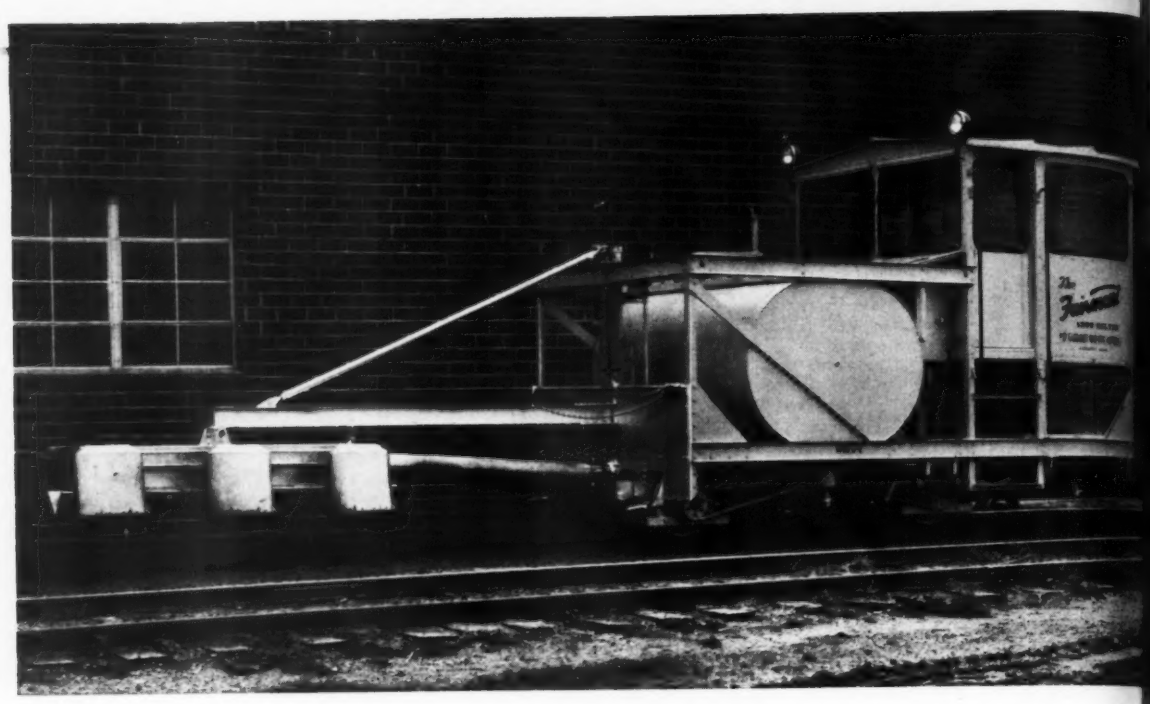
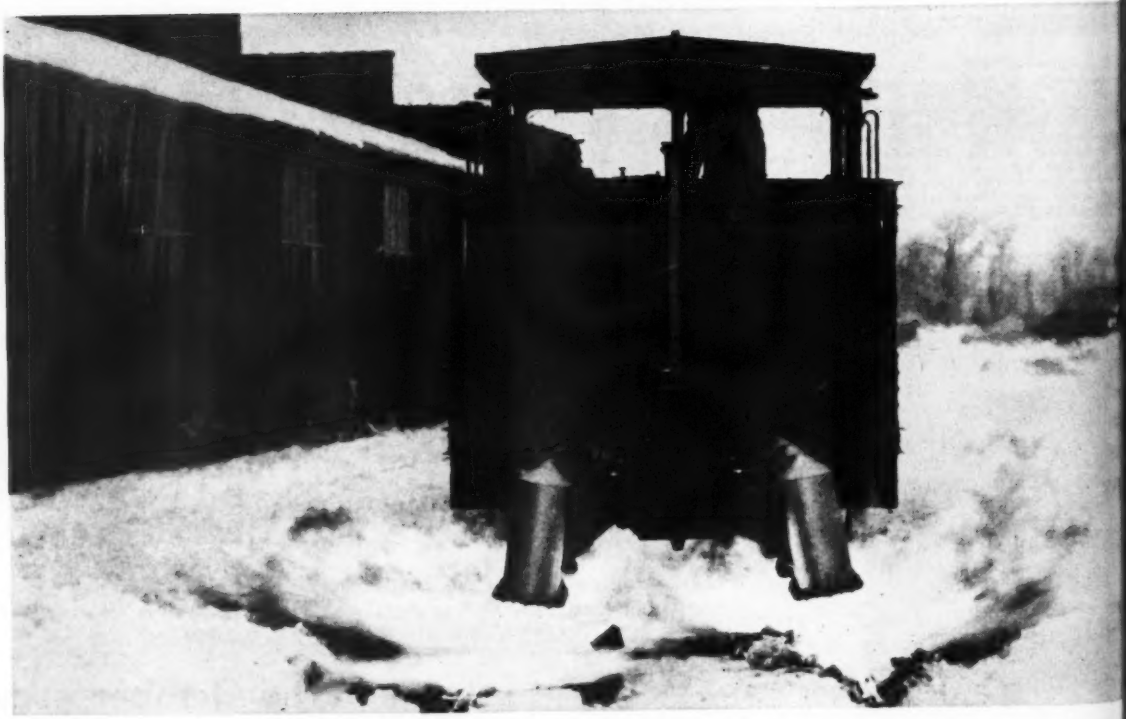


FAIRMONT



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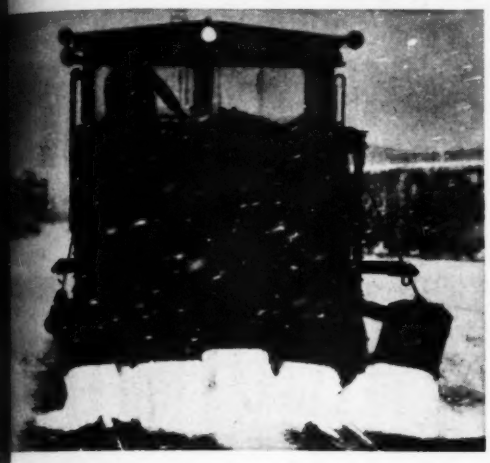

FAIRMONT ROTARY SNOW PLOW. Mounts on front of W55 Snow Melter and Weed Burner or W57 Snow Melter for plowing track sections at low cost. It also can be mounted on the rear of the W23 Series A Ballast Maintenance Car. Equipped with its own engine and hydraulic system.

New Snow Melter can pay for itself in one snowstorm!

Here's the new Fairmont W57 Series A Snow Melter—a heavy-duty "fire-breathing dragon" that will protect your railroad yards in next winter's heaviest, coldest snowstorms at a huge saving in man-hours. In fact, the man-hours saved in one storm alone can pay the original cost of the Fairmont W57!

The Fairmont W57 extends its six open-flame type burner heads—three concentrated over each rail—to clean more switches per hour than a gang of 50 to 100 men using brooms and shovels. Each air-cooled burner head has three atomizing nozzles and is positioned parallel to the rail so that the maximum effect of its hot, thick uniform flame is directed at the base of the rails. The intense heat of the flame—approximately 2,500°F.—not only melts snow and ice, but steams away water leaving switches dry and free. The Fairmont W57 is equipped with a variable speed hydraulic drive and a torque converter for flexibility at all snow melting speeds.

Plan now for fast, economical snow protection —*before* the first snowstorm ties up your yards. Call or write today for full information on the Fairmont W57 Series A Snow Melter.

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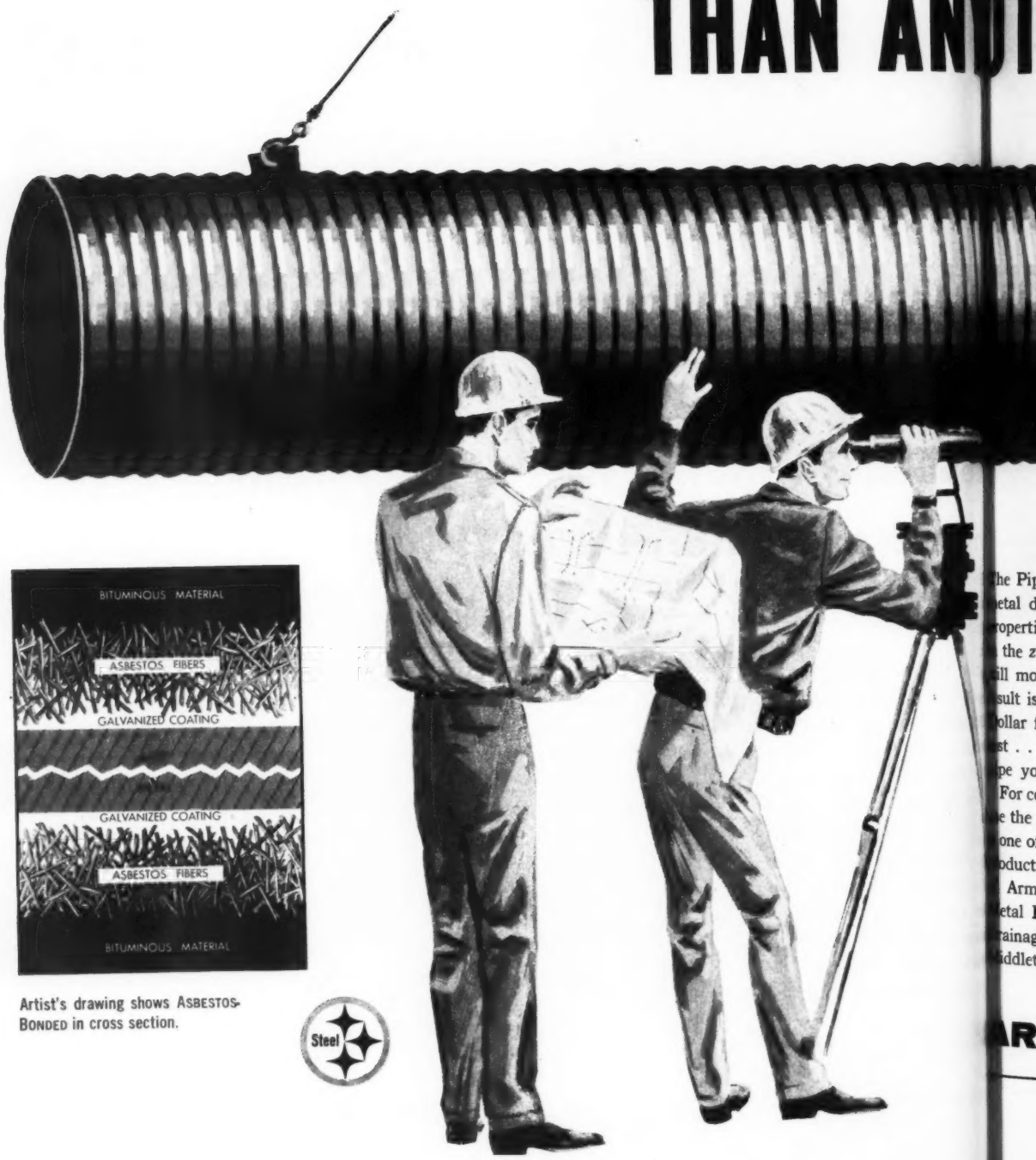

Artist's drawing shows ASBESTOS-BONDED in cross section.

Steel

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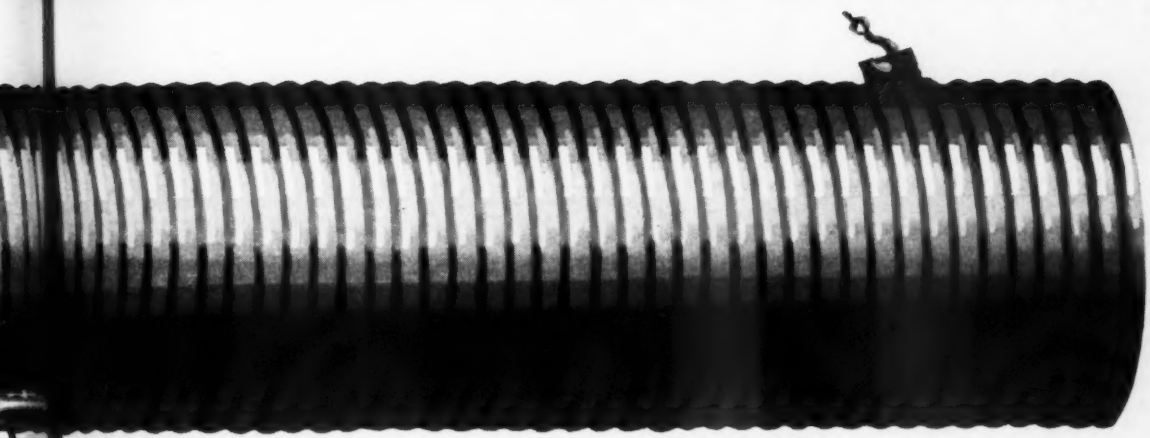

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NEWS ABOUT PEOPLE

William H. Giles
MP

Clarence Baker
MP

F. H. McGuigan
MP

S. J. Owens
North Western

L. J. Deno
North Western

H. M. Williamson
SP

CHESAPEAKE & OHIO—J. H. Metzger, staff engineer at Richmond, Va., has been promoted to assistant to chief engineer there, succeeding **F. A. Mezger** who retired recently. **S. H. Poore,** assistant engineer at Richmond, has been promoted to office engineer.

COTTON BELT—Floyd S. Leirer, relief roadmaster, has been promoted to roadmaster at Tyler, Tex., succeeding **H. G. Russell** whose retirement was noted in the August issue.

DENVER & RIO GRANDE WESTERN—Michael B. Kenyon, track supervisor at Kremling, Colo., has been promoted to roadmaster at Grand Junction, Colo.

LOUISVILLE & NASHVILLE—Charles T. Yarbrough, division engineer at Mobile, Ala., has been promoted to miscellaneous engineer at Louisville, Ky., succeeding **C. E. Stoecker** who has been promoted to special engineer there. **Conrad Hale** and **Bill Peed** each have been appointed assistant bridge engineers. **R. Thorpe,** supervisor bridges and buildings at Ravenna, Ky., has been transferred to Latonia, Ky., succeeding **J. R. Pearce** who retired recently. **W. J. Mahoney, Jr.,** assistant supervisor bridges and buildings at Latonia, has been transferred to Nashville, Tenn.

J. E. Mardis, assistant supervisor, has been promoted to track supervisor at LaGrange, Ky., succeeding **W. C. Vandiver** who has retired after 58 years of service. Other changes that have occurred recently are as follows: **Raymond W. Pember,** assistant division engineer at Birmingham, Ala., to division engineer at Mobile; **N. C. Kieffer** to division engineer in charge of construction at DeCoursey, Ky.; and **C. L. Gatton** to assistant engineer at Louisville.

MILWAUKEE—Charles L. Boland, general roadmaster, Chicago, has retired, effective August 31, after 49 years of service.

MISSOURI PACIFIC—Clarence Baker, construction engineer at St. Louis, Mo., has been promoted to assistant chief engineer there, succeeding **William H. Giles** who has retired, effective July 31, after 46 years of service. Mr. Baker is succeeded by **F. H. McGuigan,** bridge construction engineer at St. Louis, who is in turn succeeded by **J. W. Dolson,** assistant engineer there.

NEW YORK CENTRAL—C. T. Popma, district engineer at Detroit, Mich., has been transferred to Syracuse, N. Y.

NORFOLK & WESTERN—E. G. Terrell, engineer in the statistical bureau at Roanoke, Va., has been promoted to statistical engineer there, succeeding **Arthur C. Walker** who has retired after nearly 40 years of railroad service.

NORTHERN PACIFIC—J. L. Goss, system supervisor of power and heating plants, Missoula, Mont., has been promoted to engineer of water service, power and heating plants at St. Paul, Minn., succeeding **H. M. Schudlich** who retired on August 1 after 32 years of service. **E. M. Walters,** assistant engineer of water service, St. Paul, has been appointed assistant engineer of water service, power and heating plants there.

NORTH WESTERN—S. J. Owens, general manager and superintendent transportation of the Minneapolis & St. Louis, has been appointed assistant chief engineer—staff of the North Western, with headquarters at Chicago. **L. J. Deno,** assistant to chief engineer, Chicago, has been promoted to staff engineer—maintenance there.

John R. Wenzel, assistant supervisor bridges and buildings at Norfolk, Neb., has been promoted to supervisor bridges and buildings there, succeeding **C. R. Malmberg** who has been transferred to Escanaba, Mich. Mr. Malmberg succeeds **C. G. Friets** whose retirement was noted in the August issue. **R. J. Stotka,** assistant roadmaster at St. Paul, Minn., has been promoted to roadmaster at Tracy, Minn.

SANTA FE—B. F. Levet, Jr., assistant engineer in the valuation department at Los Angeles, Calif., retired recently after more than 45 years of service.

SOUTHERN PACIFIC—J. F. Hoss, Jr., has been appointed supervisor of structures at Houston, Tex., on the Texas & New Orleans (Southern Pacific Lines in Texas and Louisiana), succeeding **Thomas L. Fuller** who has been promoted to assistant engineer of bridges at San Francisco, Calif. **H. F. Kilpatrick** has been appointed track supervisor at Hachita, N. M.

Obituary

Jesse S. Hyatt, retired chief engineer of the Chicago, North Shore & Milwaukee, died on August 15 in an automobile accident near Libertyville, Ill.

Biographical briefs

Harry M. Williamson, 46, who was recently promoted to chief engineer, Pacific Lines, of the Southern Pacific at San Francisco, Calif. (*RT&S*, July, p. 10), was born at Pocatello, Ida., and graduated from the University of Utah in 1936 with a Bachelor of Science degree in civil engineering. He also attended the Harvard Graduate School of Business Administration. Mr. Williamson entered the service of the SP in 1933 as a laborer at Ogden, Utah, working summers. Two years later he was appointed a rodman at Ogden, subsequently being promoted to instrumentman. He was further promoted to appropriation clerk at San Francisco in 1940, assistant engineer at Oakland, Calif., two years later, office engineer there and assistant division engineer at Portland, Ore., in 1942. From 1942 to 1946 he was in military service with the Construction Battalion of the U. S. Navy serving in the Asiatic Theatre. In the latter year he returned to his former position at Portland, being promoted to division engineer there three years later. Mr. Williamson was further promoted to assistant engineer maintenance of way and structures at San Francisco in 1953 and engineer maintenance of way and structures in 1954. He was serving in the latter position at the time of his recent promotion.

H. F. Davenport, 34, who was recently promoted to staff engineer of the Illinois Central at Chicago (*RT&S*, July, p. 10), was born at Grand Rapids, Mich., and graduated from the University of Michigan in 1946 with a Bachelor of Science degree in engineering. Mr. Davenport entered the service of the IC in 1946 as an engineering aide at Paducah, Ky., later being transferred to Champaign, Ill. He was promoted to assistant supervisor maintenance of way at Paducah in 1948, supervisor track at Mendenhall, Miss., in 1950, serving also in that capacity at Tutwiler, Miss., and Corinth, Miss., and assistant to division engineer at Memphis, Tenn., in 1955. Two years later he was further promoted to division engineer there, the position he held at the time of his recent promotion to the position of staff engineer.

(More biographical briefs on page 94)

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As you may know, U. S. Borax & Chemical Corp. pioneered the field of dry herbicides... with particular emphasis on railroad requirements. Continuing research over the years has yielded our successful scientifically formulated herbicides. Each gives outstanding results on vegetation... each makes use of the proved plant-destroying action of borates. So, for *your* weed problems, get the right answers. Get in touch with us today to get the *most* for your weed-killer dollar!

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NEW RACOR® MECHANICAL CAR RETARDER* IS COMPLETELY AUTOMATIC!

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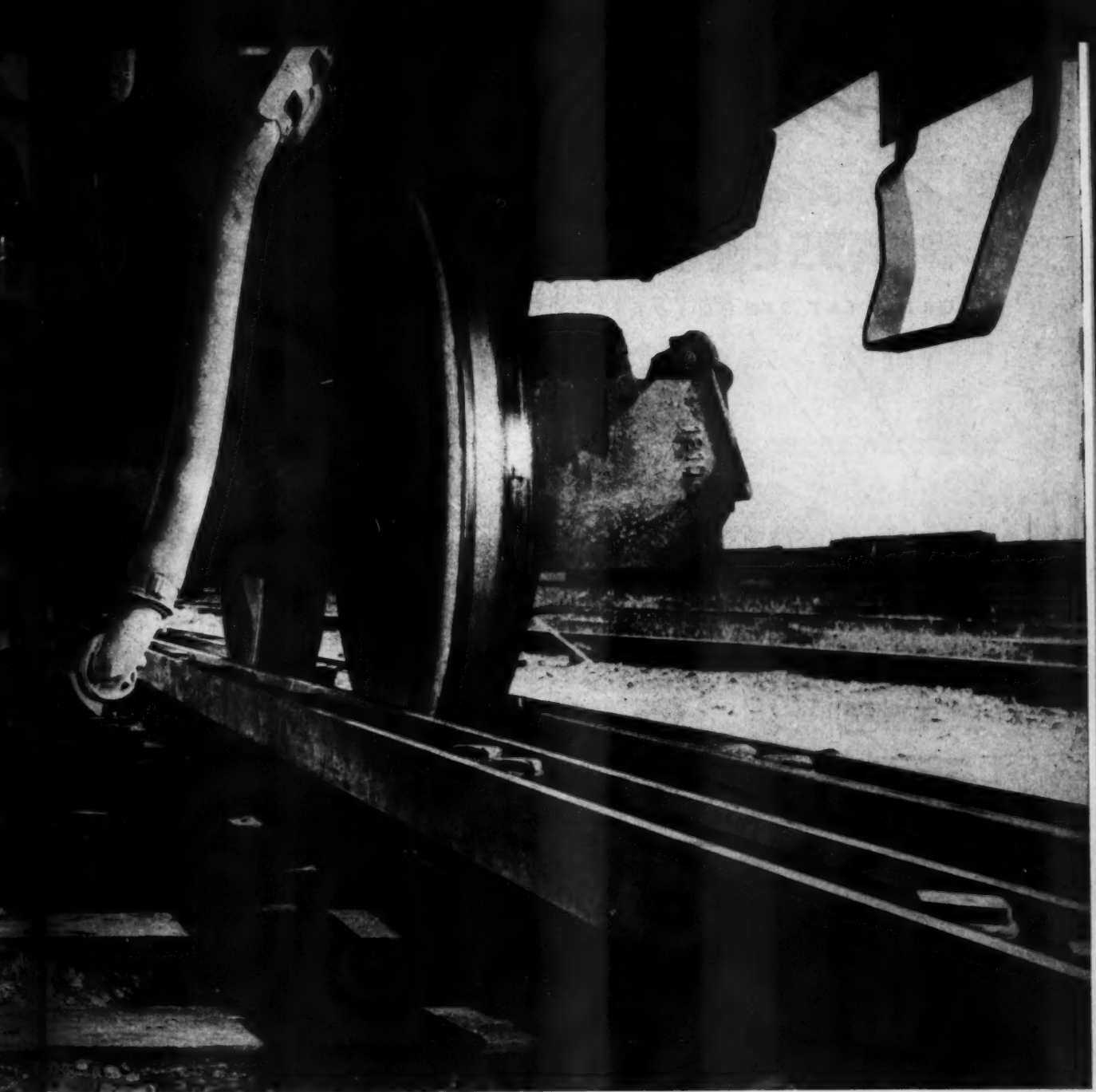
No skates or skate men are needed in gravity classification yards with this new Racor Mechanical Car Retarder at the end of each track! The consequent reduction in operating expense will amortize the cost of the retarders in a short time. Still further savings accrue from reduced damage to lading through absorption of impact as cars come together.

The Racor Mechanical Car Retarder has been designed to bring rolling cars to a stop at the end of gravity classification yard track and to resist their further movement by the impact of succeeding cars. The



enters it. Once adjusted, it needs no further attention—operation is completely automatic.

retarder consists of spring loaded rails which apply retarding force simultaneously to both rim and flange of each pair of wheels. It applies opposing forces in such a way as to eliminate the possibility of derailment. Retarding action is entirely mechanical, and no difficulty is encountered in moving either the cars or the locomotive through the retarder when the track is being "pulled".

Your American Brake Shoe representative will be glad to make a study of the operation of *your* yard in order to determine the savings that can be derived from the installation of Racor Mechanical Car Retarders. American Brake Shoe Company, Railroad Products Division, 530 Fifth Avenue, New York 36, N. Y.

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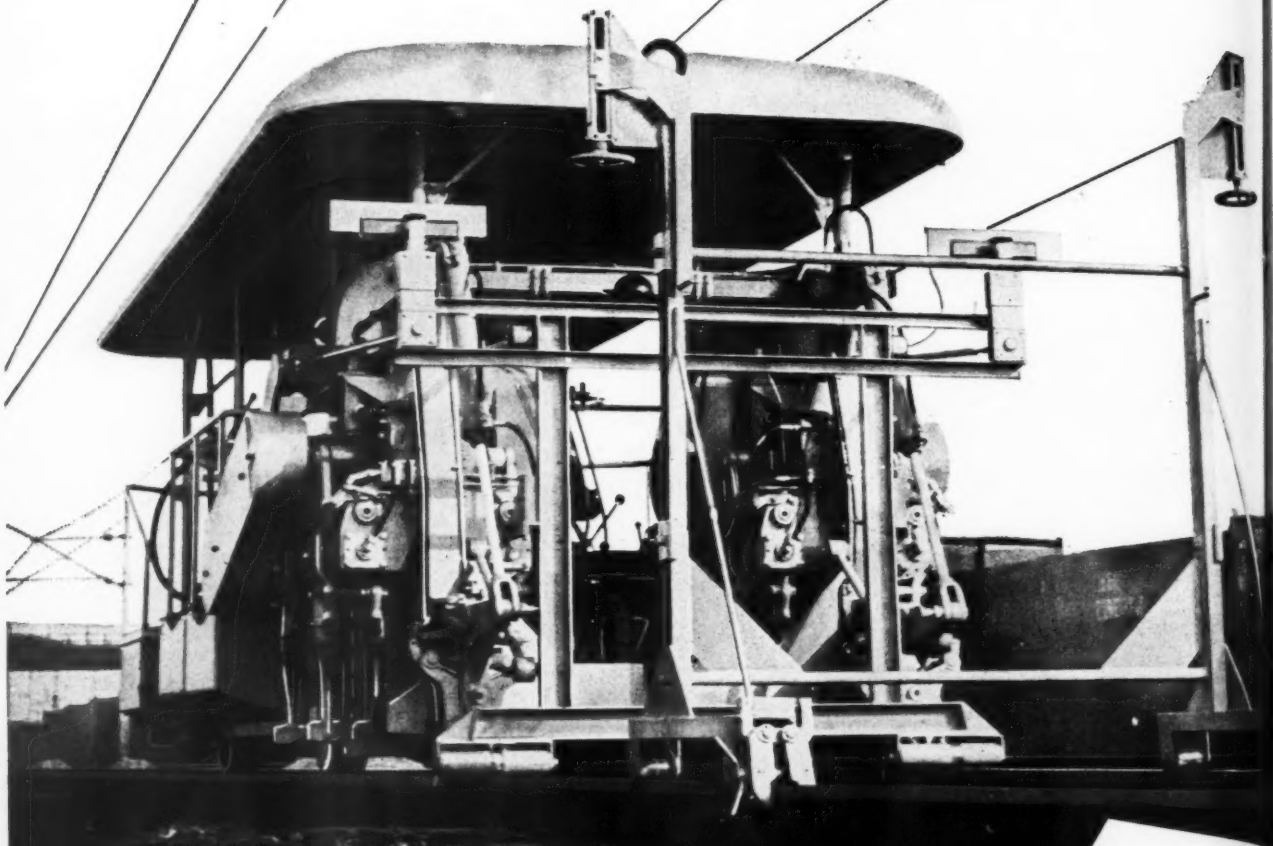

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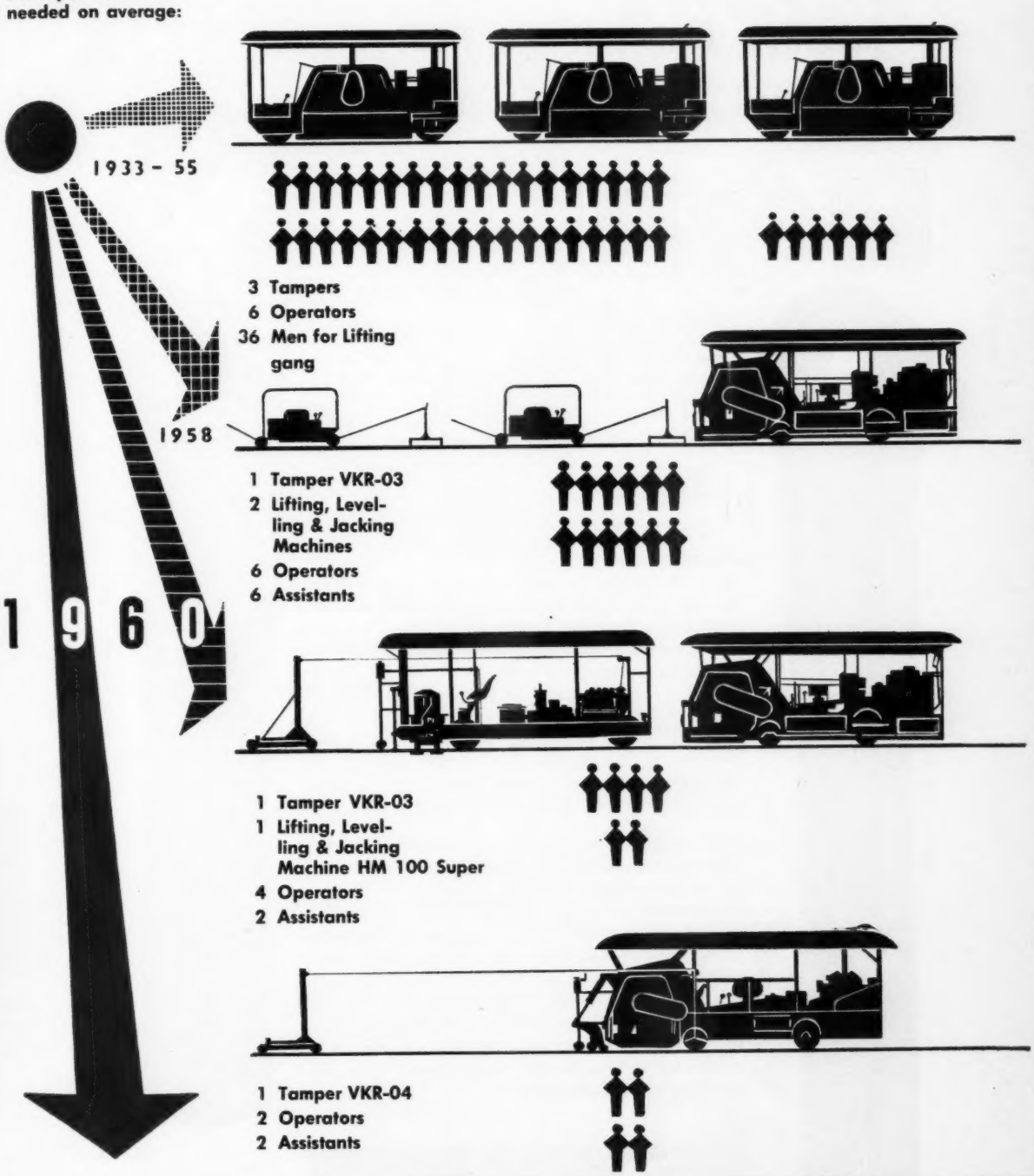

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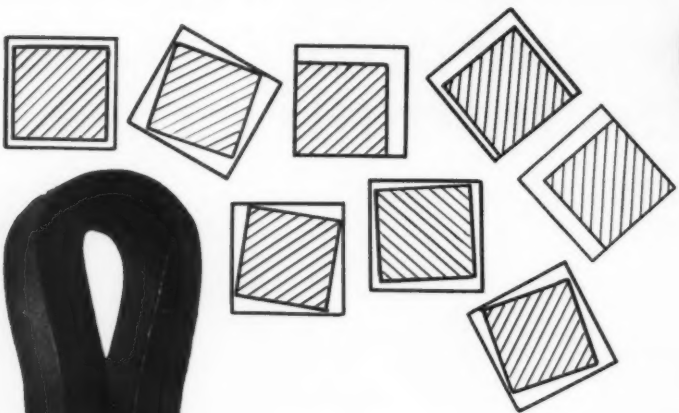
Troubled with loose fit of spikes in tie plate holes? . . . Plate cutting of ties . . . wave in the rail . . . Irregular gage?

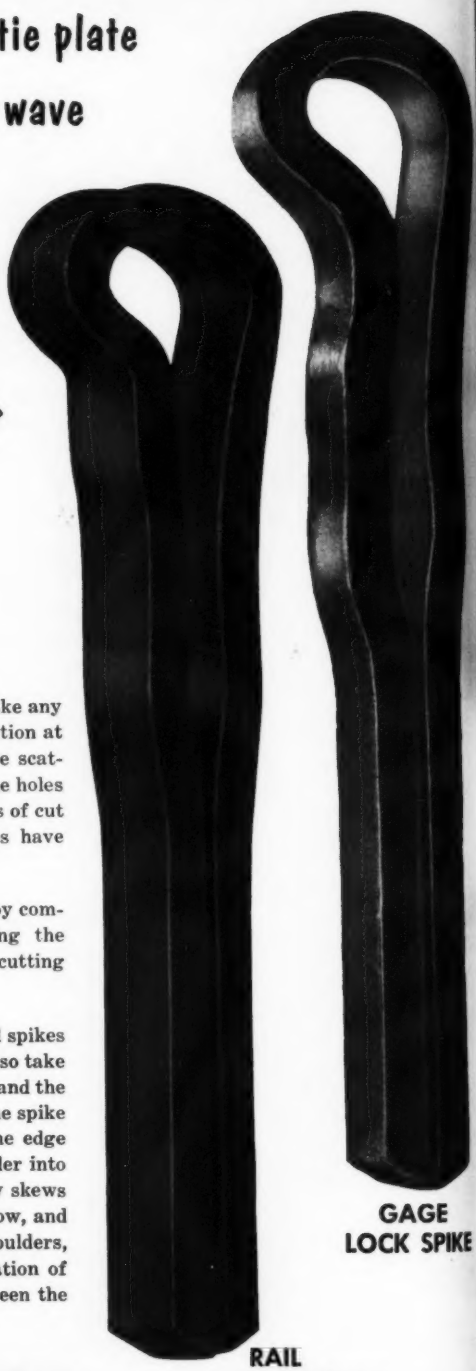


TIE PLATE
LOCK SPIKE

The common ⅝" square shank cut spike may take any one of the various positions shown in cross-section at the line spike holes of the tie plate, which are scattered about this page. A reduction in size of the holes will not correct this trouble, as exhaustive tests of cut spikes in the smaller 11/16" square lag holes have proved.

Only LOCK SPIKES completely fill the holes by compression of the spread shank—firmly holding the plates to the ties under spring tension. Plate cutting is overcome—Rail is held to gage and line.

Rail Lock Spikes and Gage Lock Spikes are rail spikes as well as plate fastenings. Rail Lock Spikes also take up the play between the width of the rail base and the tie plate shoulders. The slight protrusion on the spike head at the tie plate surface binds against the edge of the rail base and forces the opposite shoulder into contact with the rail base. This action slightly skews the tie plates, as shown in the illustration below, and binds the rail at all four corners of the plate shoulders, as indicated by the arrows. Complete elimination of play in the spike holes of a tie plate and between the shoulders is accomplished.



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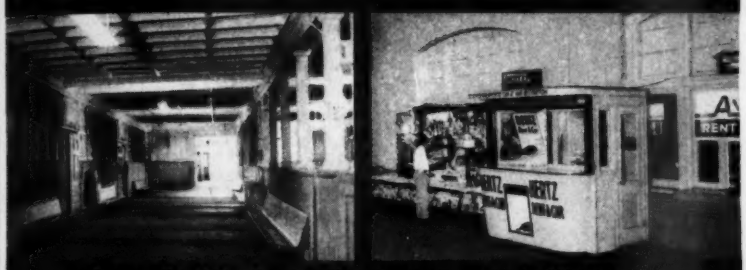
New York 17, N. Y.

Pennsylvania's Harrisburg Station. Inside—a 103,070 square-foot paint job.



Square-foot cost for Hydra-Spraying this interior came to only 4½ cents per foot.

How GRACO Hydra-Spray cut building painting costs for the Pennsylvania Railroad

When someone cuts painting costs to less than a fourth of what they were seven years ago, you've got to admit that this is a tremendously significant saving. Indeed, it's almost unbelievable!

Yet, that's exactly what the Pennsylvania Railroad did when it recently repainted its Harrisburg, Pa., station (illustrated above) using new *airless* GRACO Hydra-Spray equipment.

The cost? $4,638.15. The 1953 cost for the same building and the same square footage? $20,000. Check the company's own report . . . it's reproduced directly to the right.

Moreover, the *airless* method of Hydra-Spraying your paints and other protective coatings provides other big benefits as well:

- **It virtually eliminates overspray.**
- **Allows heavy film build-up.**
- **Eliminates pin-holing.**
- **Gives high penetration on rough surfaces and full coverage in recessed areas . . . without excessive solvent reduction.**

Ask your GRACO Railway Representative to tell you more. Write or call him today.

SPECIAL COST REPORT ON STATION PAINTING AT HARRISBURG, PA.

●

THE PENNSYLVANIA RAILROAD

Philadelphia / March 7, 1960

SUBJECT: Spray painting of interior of passenger station at Harrisburg, Pa. Total coverage, 103,070 sq. ft.

Recently the above subject station was spray painted (with new Graco equipment) by our own forces—one foreman and four painters—during their regular tour of duty 7:00 A.M. to 3:30 P.M. for $4,638.15.

In the year of 1953 this same station was brush painted for $20,000. We are unable to say what the size of the force was at that time, but we do know that it was painted during off hours, therefore causing overtime.

BREAKDOWN OF COST

(Labor and Materials to paint 103,070 sq. ft.)

Forces

One foreman and four painters

January

160 manhours @ $3.08 per hr.	$ 492.80

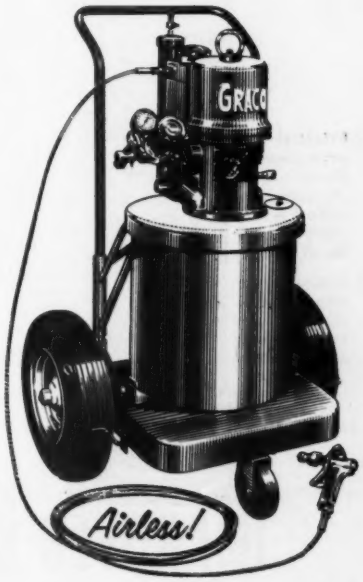
February

664 manhours @ $3.15 per hr.	2,091.60
	$2,584.40

MATERIALS

White	$ 990.00
Seafoam green	472.50
Aspen green	225.00
Bench green enamel	46.00
Varnish	31.25
Diesel fuel oil	49.00
240 meals	240.00
TOTAL	$4,638.15

Coverage per gal. of paint	approx. 270 sq. ft.
Cost per sq. ft.	$.045



GRACO RAILWAY DEPARTMENT

GRAY COMPANY, INC. • *Engineers and Manufacturers*

981 Graco Square, Minneapolis 13, Minnesota

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are only two reasons why FAIR is the world's largest selling rail anchor

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IMPROVED **FAIR®** RAIL ANCHOR

NEWS NOTES . . .

. . . a résumé of current events throughout the railroad world

It won't be long before German-built diesel locomotives with hydraulic transmissions will be in freight service in this country. A manufacturer in West Germany is building six 4000-hp units of this type, three for the Denver & Rio Grande Western and three for the Southern Pacific. Delivery is expected in about eight months.

A new type of international freight service has been initiated by the United States Freight Company, a freight forwarder. Merchandise carried in containers will be moved by rail in the U.S., cross the Pacific to Japan by ship and then move by truck to final destination. To implement the service U. S. Freight is investing $1 million in container equipment and is leasing twenty-five 85-ft Flexi-Van cars for use in the continental segment of the service. What the service means is that freight between U. S. points and the Orient will move on one bill of lading, by one carrier on one charge.

Several transactions involving changes in railroad ownership have been in the news recently. The Southern reported it had contracted to buy for $22,655,000 the 71 per cent interest in the Central of Georgia owned by the Frisco. The New York Central agreed to pay $1,700,000 for the North Western's 20 per cent interest in the Indiana Harbor Belt, and a group of private investors said it had acquired working control of the Monon in the open market.

Negotiations on the work rules dispute between the railroads and the five operating brotherhoods were scheduled to get underway on September 7. But the brotherhoods rejected a proposal of the railroads that separate negotiations be conducted on the carrier's demand that they have the right to decide if firemen are to be used on diesel locomotives in yard and road freight service.

A new contract has been negotiated between the railroads and 11 non-operating unions. It includes a 5-cent-an-hour wage increase, effective July 1, 1960, the equivalent of an additional 2 per cent increase in terms of health and welfare benefits (estimated at between 5 and 6 cents an hour), and liberalized vacation and holiday rules. Also included is $4,000 worth of carrier-paid life insurance for each active employee. A spokesman said the agreement would cost the railroads more than $112,000,000 annually.

The U. S. Supreme Court may be called on to decide if a union may strike over a carrier's refusal to apply an award of the National Railroad Adjustment Board. The Rio Grande, charging two awards of the NRAB were "clearly erroneous," refused to pay unless ordered to by a federal court. When the union struck the railroad obtained a temporary restraining order, since made permanent. Now the union is planning an appeal that could eventually take the case to the Supreme Court.

PROGRESS REPORT

SPENO

Here are the up-to-date facts on the SPENO Ballast Cleaning and the SPENO Rail Grinding Services.

BALLAST CLEANING

SPENO Engineering and Research has developed a superior screening arrangement so that we are now using an improved Ballast Cleaner with greater efficiency.

RAIL GRINDING

Our Rail Grinding Service has been so well received we are now building a *THIRD* Rail Grinding Train to take care of the increased demand.

SPENO is constantly developing means for better service to make sure that the Railroads receive everything they pay for — and more

Just Ask the Railroads That have used us!

FRANK SPENO RAILROAD BALLAST CLEANING CO., INC.

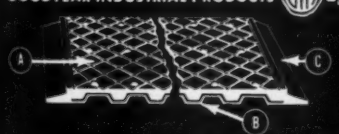
Clark Street
East Syracuse, N. Y.

306 North Cayuga St.
Ithaca, N. Y.

Ripping out railroad crossings every three years meant a $912 expense—per crossing—to this mid-Atlantic railroad. That included removal of the old amiesite and ballast—replacing both with fresh material—plus necessary resurfacing and provisions for drainage. But it didn't count the annoyance to motorists every time a busy crossing was torn up. You can end all that with Rubber Railroad Crossings, the G.T.M.—Goodyear Technical Man—promised them. So a trial installation went in nearly 4 years ago. At last report, maintenance costs on this heavily-trafficked grade crossing have come to only $12 a year—for patching approaches—with no additional repair needs in sight. And the almost $300 saving per year has sold this line additional Rubber Railroad Crossings.

Photo courtesy Western Maryland Railroad Co.

GOODYEAR INDUSTRIAL PRODUCTS GTM-Specified



Molded Rubber Railroad Crossing Pads

A Thick pad of solid, tough stock for excellent resistance to cutting, wear, weather and low temperatures

B Heavy-gauge steel plate reinforcement follows contour of corrugated pad bottom

C Tough integral flanges seal tightly against tracks when pad is sprung into place

And this is a typical experience. More and more railroads and industrial firms—the country over—are discovering how much the G.T.M.'s Rubber Railroad Crossings can save them—especially since Goodyear crossing pads are now also available for installations located on slight curves.

For full information on these longer lasting, smoother, quieter, virtually maintenance-free crossings, write Goodyear, Industrial Products Division, St. Marys, Ohio, Los Angeles 54, California, or Akron 16, Ohio.

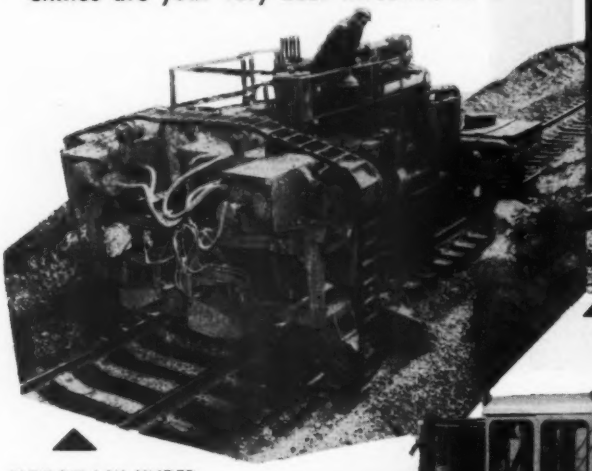
THE BIG NAME IN RUBBER RAILROAD CROSSINGS:

GOODYEAR

THE GREATEST NAME IN RUBBER

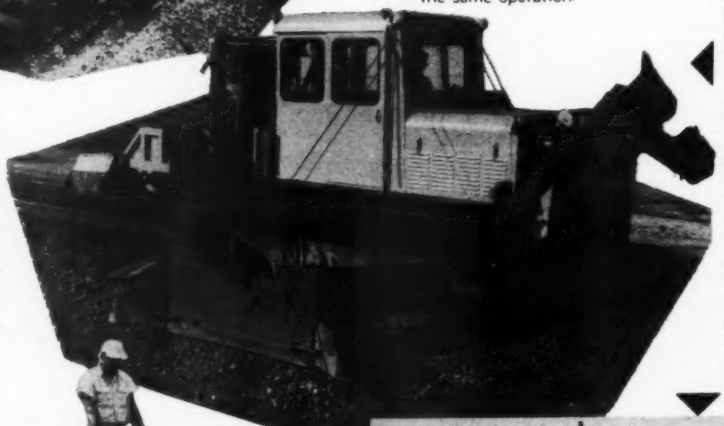
KERSHAW—

For superior trackwork equipment—designed, tested and proved on the world's railroads — look to Kershaw. You'll find Kershaw machines are your very best investment!



KERSHAW UNDERCUTTER AND SKELETONIZER—Used in skeletonizing and undercutting operations to remove ballast from beneath rails and ties, and to lower track, if desired. The Undercutter can lower track as much as six inches in a single pass, making it ideal for tunnel cleaning, or lowering track in station grounds at bridge approaches or crossings.

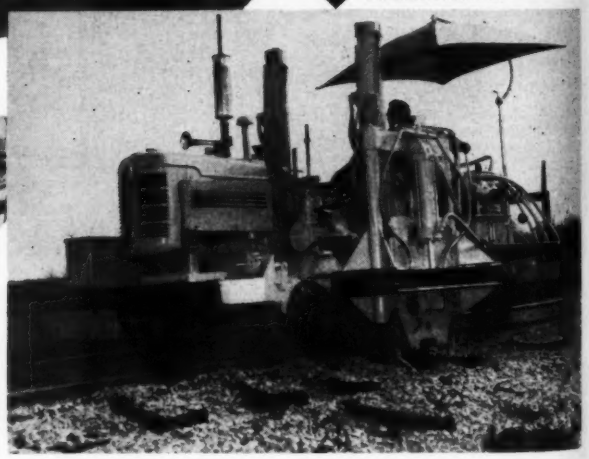
KERSHAW CRIB-ADZE—Designed for high-production rail relaying gangs, the Crib-Adze, working off either rail in either direction, cribs between the ties, automatically adzes the ties in the same plane, and sprays wood preservant on ties all in the same operation.



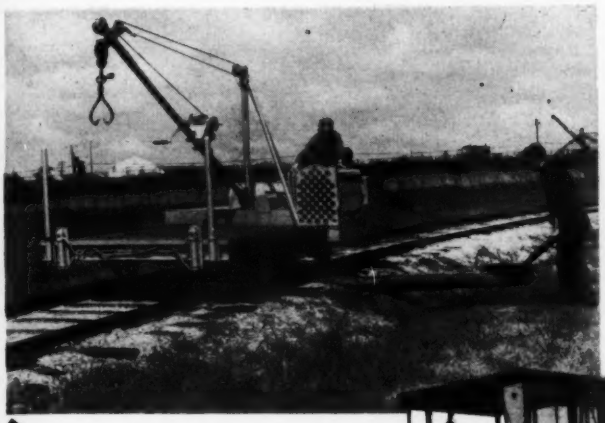
KERSHAW BALLAST REGULATOR — Now available in three models, the Heavy Duty, the Standard and the Special. Among the 14 distinct operations performed by the Ballast Regulator are these: Used as a track patrol to scarify, deweed, regulate and shape the ballast shoulder; used with surfacing gangs to regulate and distribute ballast ahead of tampers; used to regulate and shape the ballast slope after surfacing, freeing an entire regulating and dressing crew for other jobs.

KERSHAW SUPER JACK-ALL—A combination hydraulic jack-tamper designed for high production track raises ahead of one or more tampers. The Super Jack-All jacks track inside rail and tamps outside rail with tamping feet actually going under tie ends. Kershaw also manufactures a Standard Jack-All.

KERSHAW SELF-PROPELLED, BRUSH-TYPE KRIBBER — Designed for smaller rail-relaying gangs, this machine is used for cribbing and brushing ahead of adzers. The self-propelled feature allows you to set the machine at the desired cribbing depth. It then moves down the track automatically, cribbing and brushing at the desired depth.



-*first* in the development of original machines!



KERSHAW TRACK CRANE–A self-propelled machine, equipped with tie inserter, for use in timbering gangs. The Track Crane is used to redistribute and position new ties for insertion, to insert new ties, and to pick up and stack old ties.

KERSHAW TWO-WHEEL KRIBBER–Used for skeletonizing. The machine removes ballast from the center of the track and also from between the ties and outside the rails. . .

KERSHAW TIE BED SCARIFIER (with tie inserter attachment)–Used to scarify old cemented tie beds in timbering gangs, and for inserting ties. With special Crib Cleaning Attachment, it is used behind Two-Wheel Kribbers for removing all ballast, including ballast under the rail.

KERSHAW UTILITY TRAILER — Equipped with rails for moving trackwork equipment. Trailer comes in three models, single axle, double axle and triple axle, with capacities from 4,000 to 18,000 pounds. The machine also comes in models without rails for moving off track equipment. Only one man is needed to load and unload equipment onto track.

KERSHAW TRACK BROOM —Cleans car drippings and other waste materials from track, removing waste beyond shoulder and leaving cleanly swept track down to tops of ties. Used in classification yard tracks. The Track Broom also may be used in surfacing operations to remove loose ballast from track after surfacing

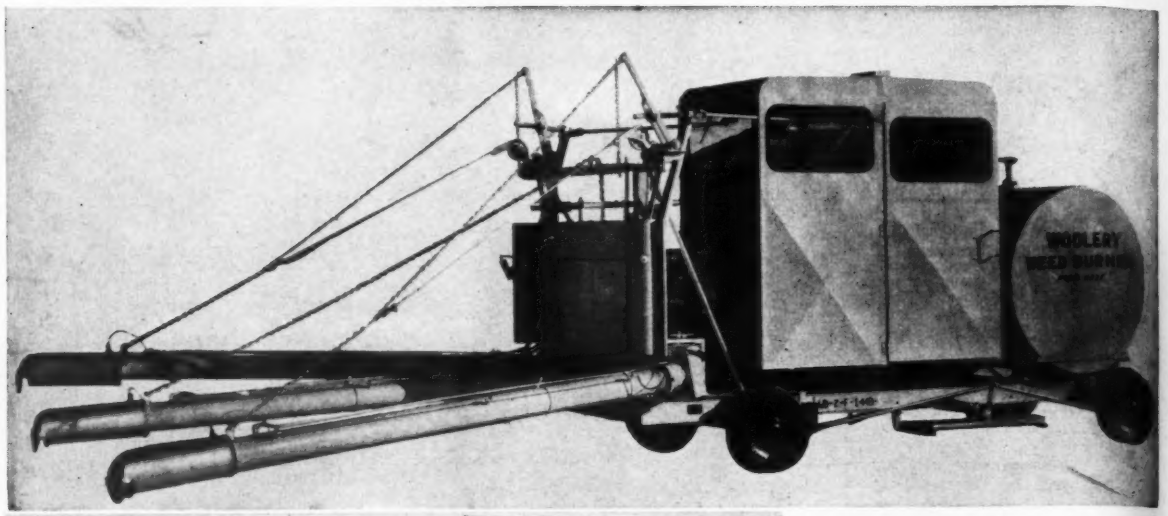
Recognize This Symbol of Leadership

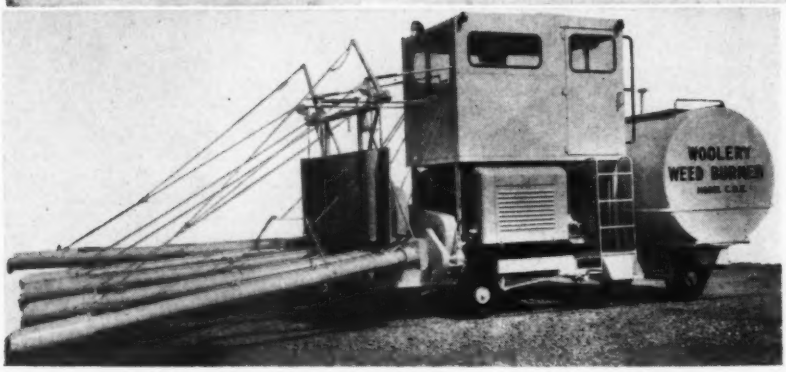
KERSHAW MANUFACTURING CO. INC.

MONTGOMERY K ALABAMA

WOOLERY

FOR LOW COST TRACK MAINTENANCE

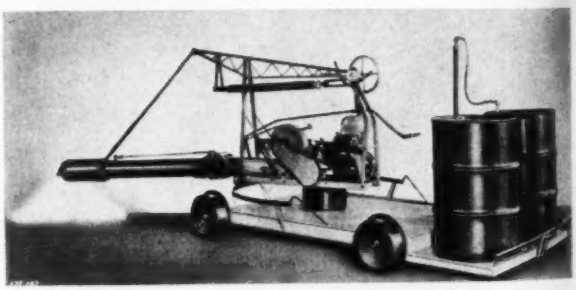




WEED BURNERS

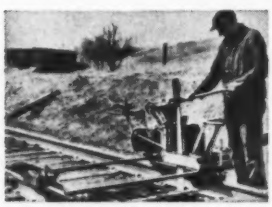
The model WB-2-F (above) has automatic transmission with torque converter; constant blower speed regardless of rate of travel; an all steel cab with safety glass, two entirely separate brake systems and a final drive with chains and sprockets located outside the wheels for easy adjustment. A separate 15-H.P. air-cooled engine is used to drive the blower. Thus when speed is reduced—such as is necessary in yard or snow melting work—the blower speed maintains the same rate and heat intensity.

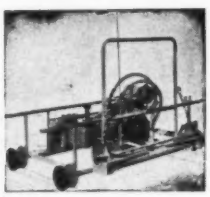
The model COE (above) makes use of a torque converter on the propelling engine which gives any speed desired for burning or deadheading. It burns to a width of 25 feet using all five burners. If desired, a second trip can be made with the two outer arms extended to an additional width of five feet on each side. Burners are under separate and instantaneous control of the operator. The two outer arms can be raised or lowered or can swing in or out to coincide with the contour of the ground. Other Woolery Burners include the Model PB-B, 3 burner portable and the AB single burner portable (shown at right).



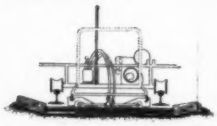
TIE CUTTERS - TIE-END REMOVERS

The Woolery Tie Cutter is a sturdy, light-weight machine that replaces ties with a minimum amount of disturbance to line or surface of the track. A reciprocating saw blade cuts the ties just inside the tie plate on both sides. The center piece is pried out and the Woolery Tie End Remover pushes the ends out thru use of a double-acting, double-ended hydraulic cylinder.





A simple turn of the valve handle causes the two tie ends to be pushed completely clear of the rail.



SPIKE DRIVERS

The Woolery Spike Driver is designed primarily for use by tie renewal gangs. Various other pneumatic tools can also be operated with it. Rubber-tired set-off wheels.

WOOLERY MACHINE COMPANY

29th and Como S.E., Minneapolis, Minn.

BE THERE!

CHICAGO LAKE FRONT

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in 1961

WORLD'S LARGEST—MOST BEAUTIFUL—CONVENTION BUILDING TO HOUSE GREATEST DISPLAY SHOW IN THE FIELD OF RAILROADING.

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Servicing roadway machines

One of the most controversial, as well as enigmatical, subjects among M/W officers today is: How many roadway machines should a mechanic service and maintain?

Some officers would like to have this question settled by getting together and agreeing upon a set number of units. But this is met by a strong reaction from others who feel it would be unwise to establish a hard-and-fast ruling as to the number without any regard being given to the types of the machines, their general construction, size, age, etc.

As an example, transmissions differ on machines; hence their wear factors are different. Also, they may have fast or slow-moving parts; hydraulic, electrical, mechanical or cable controls; forced or gravity lubrication; and air or water-cooled engines. In addition, some machines work in or with dirt, others with paint or other materials—all of which have some influence on the wear on the machines. These differences make it extremely difficult to determine the repairs which can be expected for each type or unit.

AREA's Committee No. 27 has been struggling with this problem. But reports are that the subject generates more heated dissent than agreement among its members.

As it is, each road is feeling its way with more or less success. But many are not happy over the results presently being obtained.

The financial stake in roadway equipment is large and will become larger. With continued rising costs of labor and materials, more machines will be developed and used to get work done. It will then be more than ever necessary to have a workable guide for assigning mechanics to machines.

Standards needed for figuring unit costs

Just about every new step taken by the maintenance of way forces these days is aimed at getting costs down. Because railroad management keeps hammering away at the subject of cost reduction most engineering officers have become more cost conscious than ever before. And rightly so; in at least some instances the financial and physical health of a railroad hinges on the ability of the M/W forces to maintain the property adequately with a decreasing proportion of total revenues.

In this atmosphere M/W officers have become more than cost conscious; they've developed what might be called a "cost-sensitive" attitude, particularly with respect to comparative costs on other roads. Because cost reduction has developed into such a serious business any reports of unit costs are noted with keen interest and examined critically. The reason, of course, is that an M/W man is inclined to feel he is "on the spot" with his own management if reported unit costs on other roads are less than his own.

The result has been a situation that, to say the least, has some negative aspects. The fact is that some M/W officers have developed a tongue-in-cheek attitude toward cost figures quoted by their colleagues on other roads. This attitude—bordering on suspicion—stems from a conviction that these cost figures have not always included everything that went into the particular item.

Basically, the tendency of railroad men to compare their unit costs with those on other roads is a healthy development. Competition is the essence of private enterprise, and a desire to come up with lower unit costs than the other fellow is part of the over-all picture. But the purpose of such competition, i.e., to develop the lowest unit costs through true efficiency, is defeated if it is possible to shrug off the other fellow's costs on the basis that they are not a factual representation of the true picture. When this happens the situation is nothing less than chaotic.

In some quarters it is held that man-hours per unit of work done is a more reliable yardstick of performance than unit costs in dollars. Perhaps so. But even where this unit of measurement is used there must be a clear understanding of what man-hours are included and how they are figured. One authority on this subject suggests that, to help eliminate misunderstanding, there would be advantages in using the work done per man-hour paid for as the criterion of performance.

The fact is, however, that railroad men are not going to have much faith in performance figures developed by other roads until standard formulas for figuring costs are adopted and generally applied. The development of such formulas is a project that can be undertaken only by the interested associations in the field. The AREA is well equipped for such a project, but the Roadmasters' and B&B associations are equally interested in seeing that standard criteria are adopted for figuring unit costs.

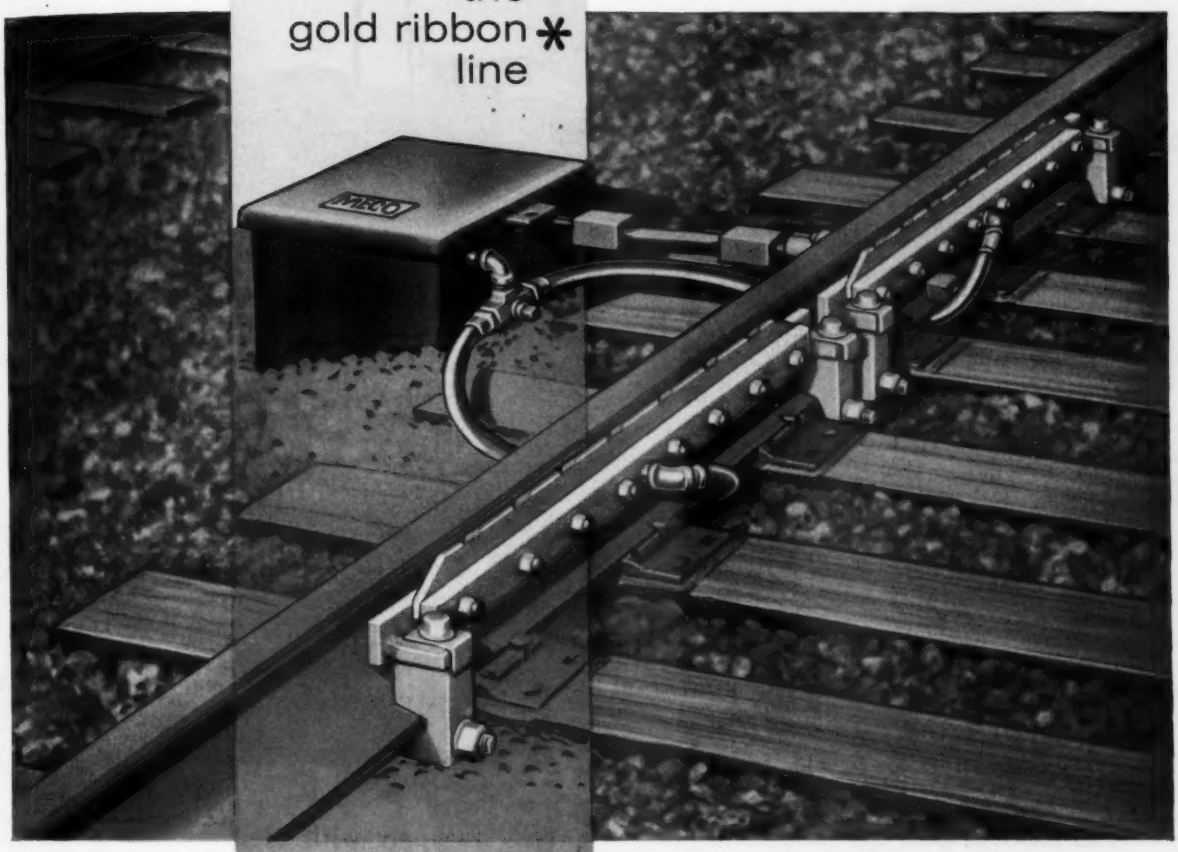
How much better it would be if all railroad men were able to speak the same language when discussing unit costs!

SPECIFY

MECO

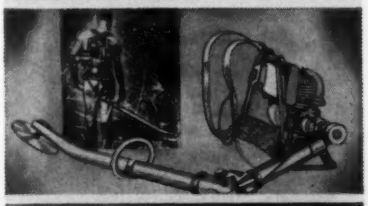
new model MC rail and flange
LUBRICATOR

the gold ribbon * line

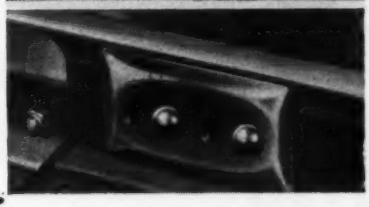


the MECO gold ribbon line includes:

COST-CUTTING POWER RAIL LAYER



HIGH-SPEED BRUSHCUTTER



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GEARED TO PROGRESS
PRI MEMBER

Y-6858

gives dependable care-free lubrication everywhere it's needed, automatically

In modern railroading *every*where includes; grades, switch points, guard rails and running rails, as well as curves — *Every*where that friction-forces are at work, new "advanced design" MECO lubricators will reduce friction to a whisper. *Quadruples* the life of rails and wheel flanges!

MECO lubricators cost less to install—Attach to standard rail without special preparation. Once installed, a wheel-activated mechanism dispenses just the right amount of grease through the even-flow distributing bars directly to the rail and wheel flange for waste-free, care-free lubrication, automatically.

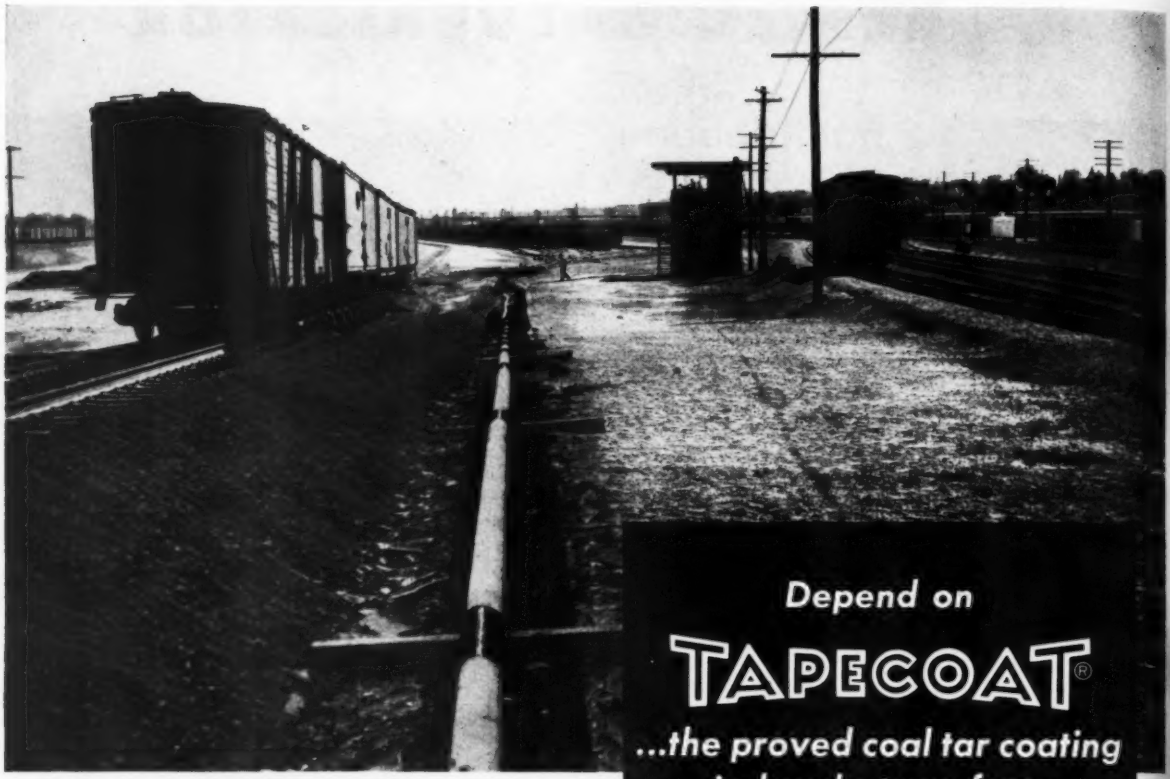
Ask one of our men to give you the extra-profit facts on the "gold-ribbon" MECO lubricator. Or write direct for full information.

Maintenance Equipment Company

* a standard of quality, value, performance and service

RAILWAY EXCHANGE BLDG., CHICAGO • DIVISION OF POOR & COMPANY

How to Protect Pipe in Underground Service



Joints on line are TAPECOATed to assure protection against corrosion equivalent to mill coating on the pipe.

You take no chances when you specify TAPECOAT coal tar coating to protect pipe, pipe joints, fittings, couplings, tanks, tie rods, conduit and cable.

Since 1941, TAPECOAT has proved its superiority in resisting moisture, acids, alkalis, chemical fumes and other severe corrosive and abrasive conditions.

For example, an eastern railroad had a problem with air lines buried in cinders because of frequent failures due to severe corrosive attack. In 1948, this company turned to TAPECOAT and the lines have remained in perfect condition ever since.

TAPECOAT comes in rolls of 2″, 3″, 4″, 6″, 18″ and 24″ widths. It is easy to apply with the use of a torch. No skilled help is required.

A TAPECOAT sales and service engineer is always available to help you on your specific corrosion problem. Write for details today.

GEM

The TAPECOAT® *Company*

ORIGINATORS OF COAL TAR COATING IN TAPE FORM

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Representatives in Principal Cities

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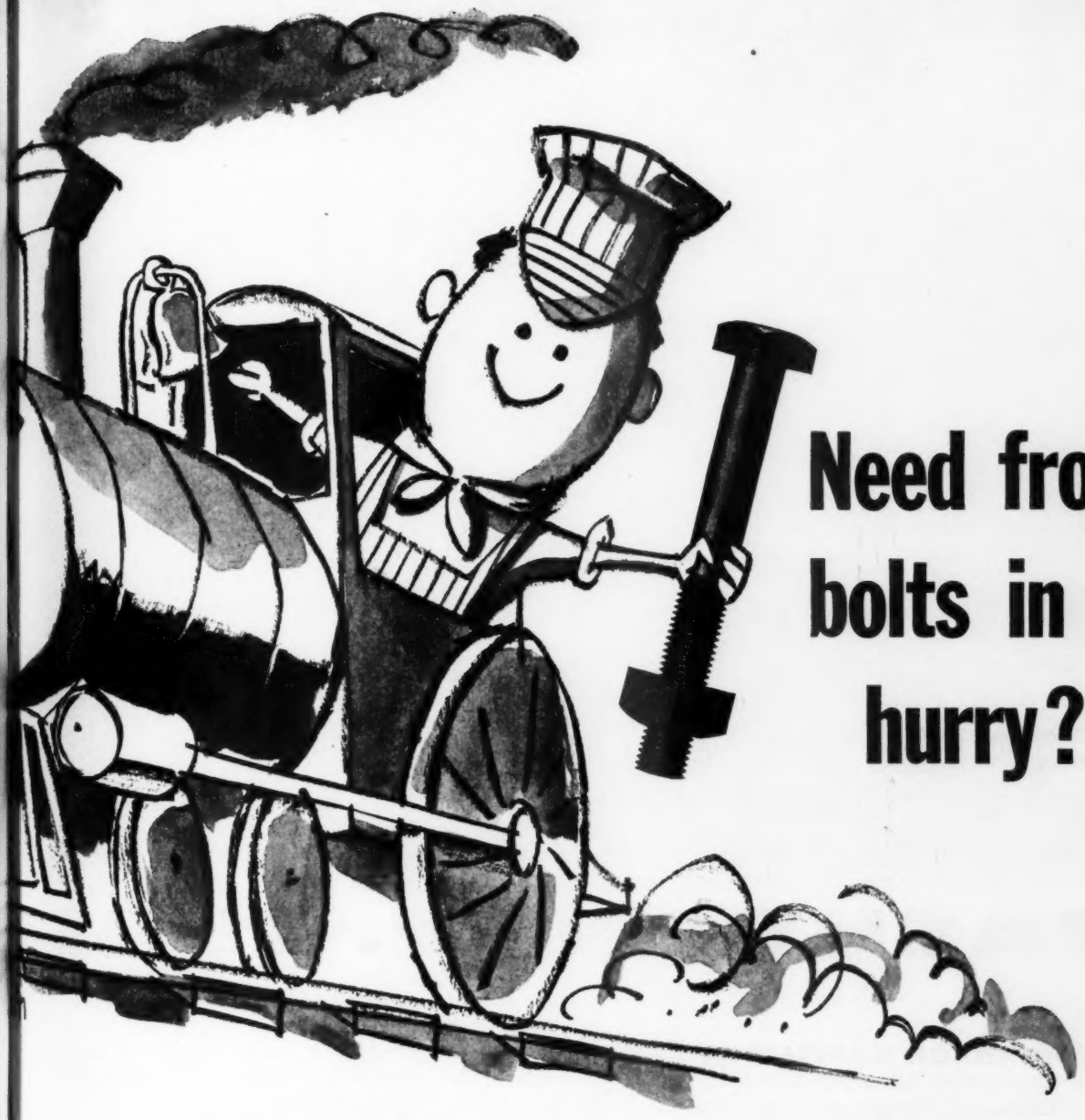

Need frog bolts in a hurry?

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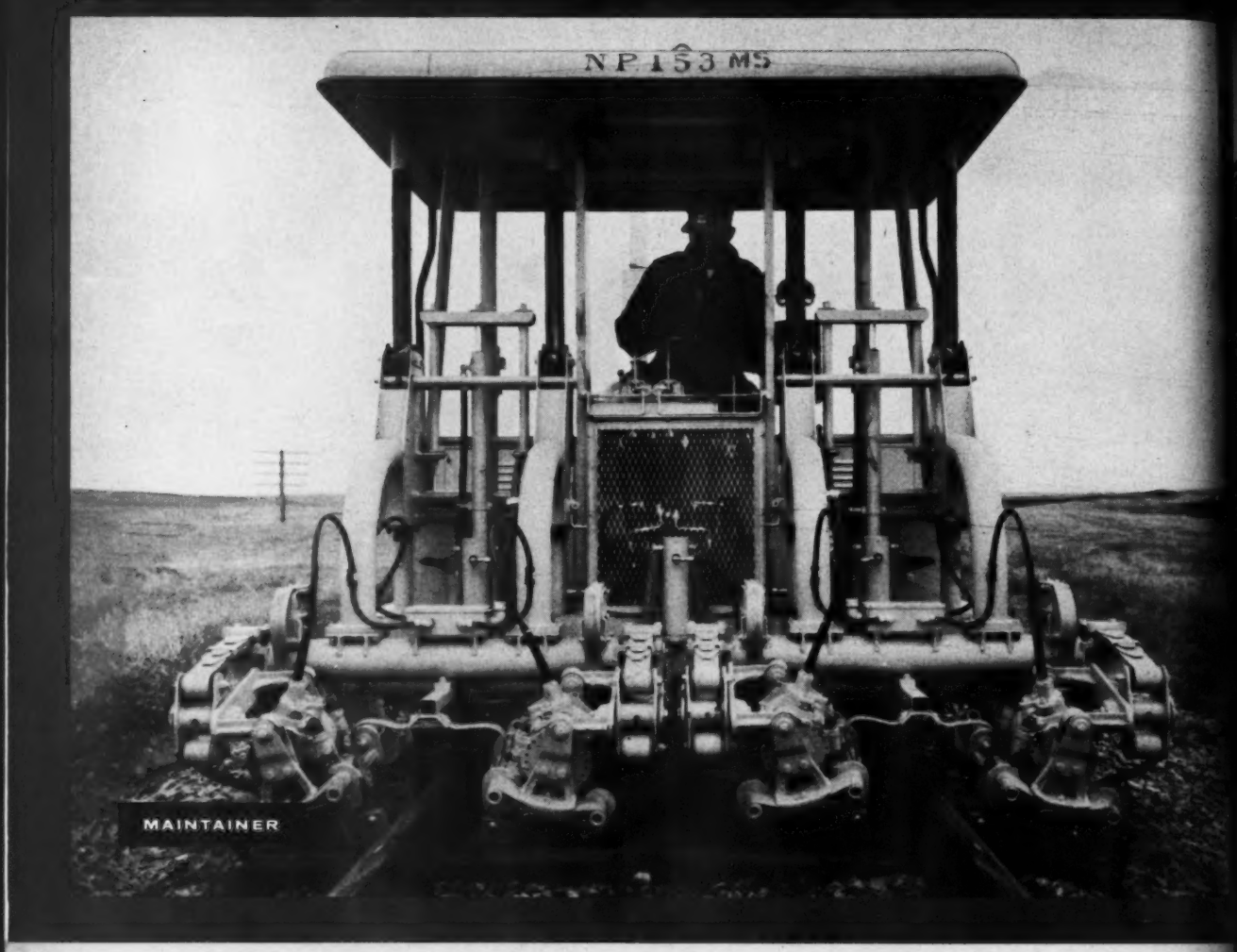

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907

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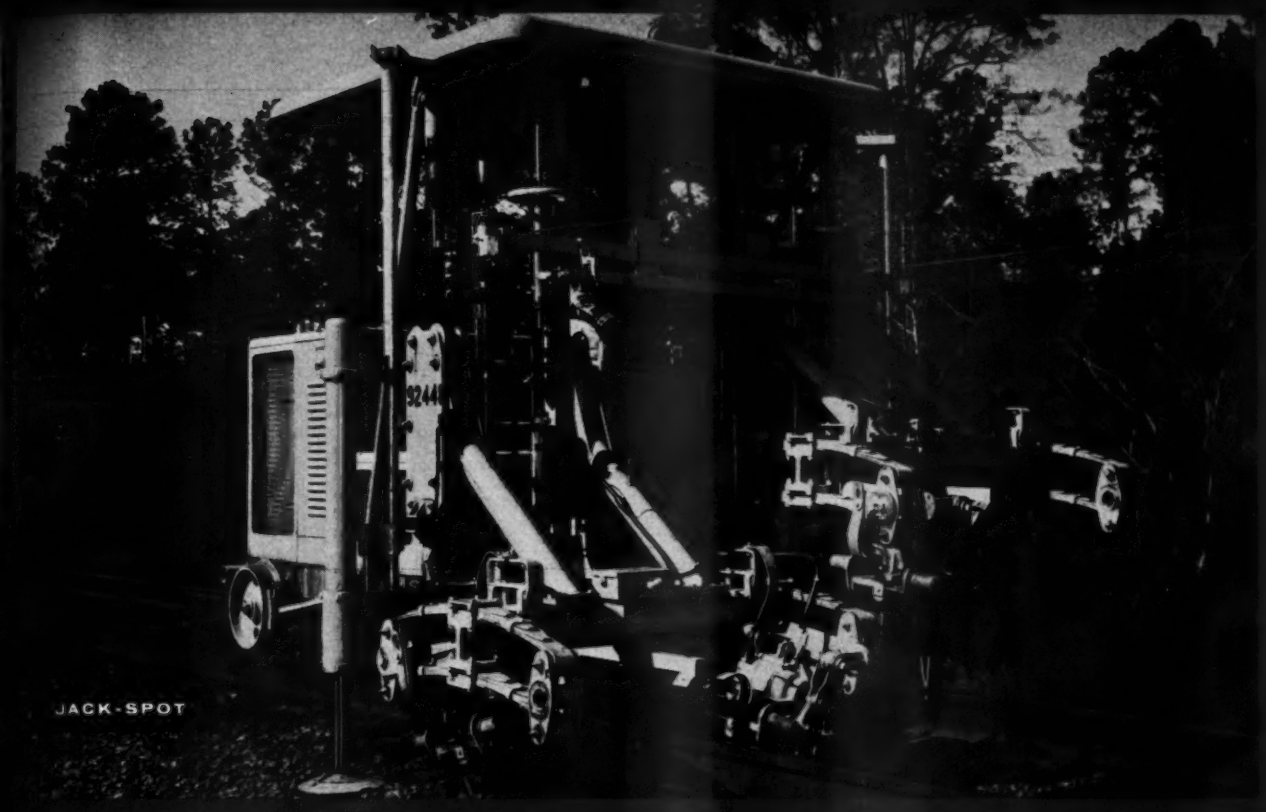

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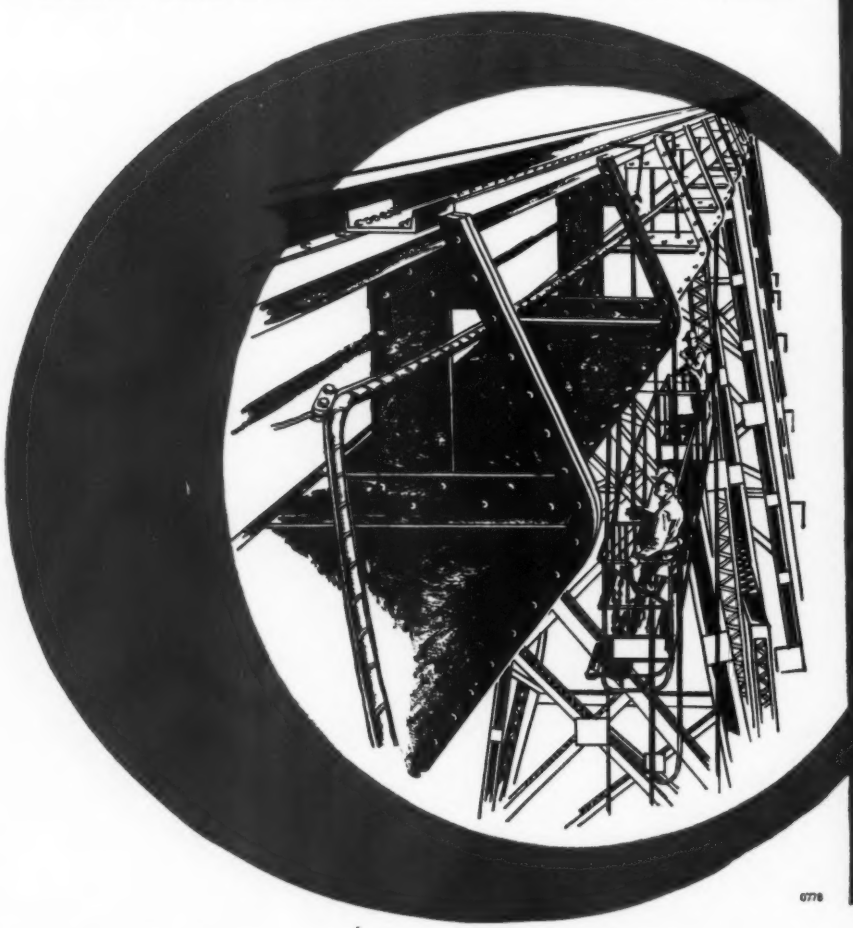

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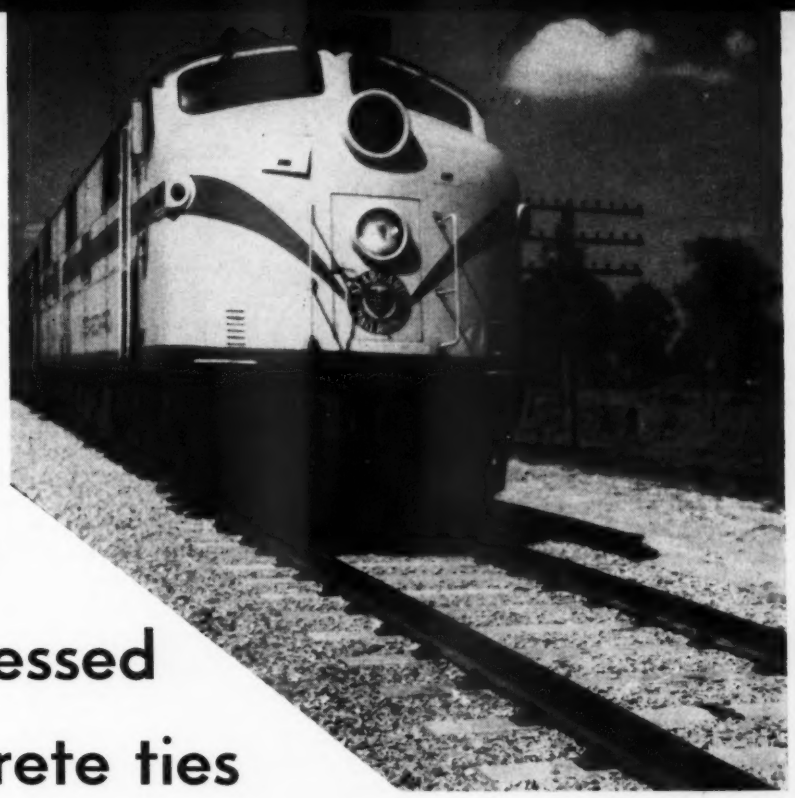


TWO SECTIONS of prestressed concrete ties have been in service since last March, one on the SAL (shown here) and the other on the ACL. Each has about 600 ties.

PROGRESS REPORT

Service tests of prestressed concrete ties

By G. M. Magee and E. J. Ruble*

Early this year two extensive service tests of prestressed concrete ties were installed in main-line tracks on different roads. The test installations and the design of the ties installed were described in the April issue.

Various questions are now in order. How have the ties performed in service? What problems, if any, have been encountered? Have the test sections required any maintenance work?

These and other questions are answered here by the designers of the tie installed. Included is a preliminary report on measurements made to determine stresses in the ties under load.

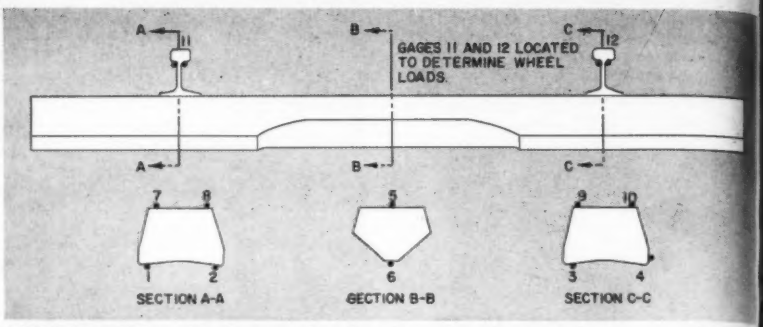
● In March of this year twin installations of prestressed concrete ties were installed on the Atlantic Coast Line near Four Oaks, N. C., and on the Seaboard Air Line near Tampa, Fla. The ACL installation is approximately one-quarter mile in length under one length of continuously welded 132 RE rail, with the concrete ties spaced on 30-in centers in crushed granite ballast. The Seaboard installation is also approximately one-quarter mile long. It includes one length of 115 RE continuously welded rail and three 39-ft jointed rails on each end, with the ties also placed on 30-in centers in crushed granite ballast.

At both locations the alinement is tangent, the ACL installation being in the northbound track of a double-track line and the Seaboard installation being on single track. The traffic density at the test site on the ACL is approximately 11,000,000 gross tons annually and on the Seaboard it is approximately 17,000,000 gross tons annually.

One question that now arises is this: How are the ties standing up in service? Since the installation on the Seaboard was completed, 21 ties have developed cracks at the field end of the tie plates through the recess provided in the tie for the fastening nut. All of these ties had the wedge-nut type of fastening. It had been anticipated that difficulty might be experienced in this respect from the wedge nuts. As a matter of fact, the first ties submitted to the Research Center for tests had wedge nuts shaped like a frustum of a cone. Nuts of this type resulted in radial pressure lines from the wedge action when the bolts were tightened and these caused the tie to split longitudinally with a very few applications of loading in the repeated-load testing machine in the laboratory. Accordingly, the design was changed so that the wedge was rectangular with the

* Mr. Magee is director of engineering research of the Engineering Division, AAR, and Mr. Ruble is research engineer structures.

Concrete ties cont'd



NUMBERED DOTS on this diagram show locations of strain gages that were applied to six consecutive ties in the Seaboard test section at time of installation. Purpose of the gages is to measure stresses in ties under trains.

two short sides parallel and the two long sides forming the taper. The recesses in the ties were then formed so that the wedging action of the nut was parallel to the axis of the tie with the thought that the wedging or splitting forces developed by the wedge would be offset by the prestressing compression in the concrete.

Evidently, in the 21 ties that developed cracks, the wedging action of the nuts was sufficient to cause concrete failure as the cracks extend the full depth of the tie, being as wide at the top as at the bottom, indicating tensile stresses on the full cross section. However, this has occurred in only a relatively few of the ties of the 300 installed with the wedge nuts on the Seaboard and in only one on the ACL. In neither installation has there been any cracking of the tie through the recess provided for the bolt holes where inverted channels and spot-welded nuts, located in a recess in the bottom of the tie, were used as a means of holding the fastening bolt.

Hairline cracks in few ties

Another condition of cracking that was observed in a few ties on both the Seaboard and ACL installations was the formation of one or more hairline cracks across the top of the tie near mid-length. It is believed that these cracks developed during installation. In unloading the ties from the cars they were grasped by a special clamp at mid-length and were dropped rather rapidly to the ground, being caught with a rather sudden jerk before actually striking the ground. This would tend to develop high tension stresses at the top mid-length of the tie due to the inertia effect of the tie when its downward movement was quickly stopped in this manner. This may perhaps account for the development of some of the cracks.

Another possible explanation of the hairline cracks has to do with the difficulty experienced in getting the bolts started in the wedge nuts where laminated wood pads were inserted between the tie plates and the ties. The bolts were a little too short to start readily when the double-coil washer was not compressed. In some instances on the Seaboard a crane was used to grasp the tie at the middle part and hold it firmly up against the rail base to aid in getting the fastening bolt started. This, of course, could produce a high tension at the top mid-length of the tie and may possibly explain the development of some of the hairline cracks. These cracks, which are very small, have not appeared to progress any farther since the original installation, and probably will not appreciably effect the service life of the tie.

With these hairline cracks in mind a review of the design calculations was made, which shows that a change made in the forms at the time of construction to facilitate the formwork produced more of a change in the distribution of the prestressing force in the tie at mid-length than was anticipated. A check of the calculations revealed that the ties as actually formed have a slight tension on the top surface from the prestressing, rather than compression over the entire cross-sectional area.

A slight change in the shape of the ties and the position of the steel has been made to correct this condition. As a result of these changes a compression of approximately 300 psi will be obtained at the top part of the tie from the prestressing force. It is anticipated that this will prevent the formation of such cracks during unloading or installation. Further, if such cracks should form, this prestressing compression will tend to close them in actual service so that their presence will not be of importance in causing deterioration of the concrete.

Maintenance work

The principal maintenance work that has been required in the time that these test installations have been in service has been for checking and retightening of the clip bolts. A tightening torque of 120 ft-lb was used on the clip bolts to give a bolt tension of approximately 8,000 lb, or a force of 16,000 lb holding the rail, tie plate and tie assembly together at each end of the tie.

What chief engineer says about SAL test section

What has been the railroads' experience with the test sections of concrete ties? Here's what T. B. Hutcheson, chief engineer of the SAL, has to say about the section on his road:

"In our opinion, the track rides as smoothly as any welded rail we have. It is therefore our conclusion that the wider tie spacing has no material effect on the riding quality of the track; at least that has been our experience to date.

"On April 8 and 13 approximately 200 ties were spot-tamped at a cost of $200. A few rough spots had been reported in the test section and we decided to go ahead and smooth all ties which needed any adjustment whatsoever. On April 13 all bolts were checked and tightened, if necessary, at a cost of $52.

"With the exception of two ties which cracked and were replaced, the above constitutes maintenance work performed to date in this test section. I understand the two ties which cracked were removed for the purpose of making a detailed examination to determine the cause of cracking. I believe a full report will be issued by AAR in due course on these ties."

PENCIL points to crack of type that developed in 21 ties in Seaboard test that had wedge-nut fastenings.

Originally it was planned to use a torque of 150 ft-lb in tightening the bolts to produce a tension of 10,000 lb, but after installing a few of the ties with this bolt tension it was evident that it was causing the rubber insulating bushings to be squeezed out and torn. Consequently, the torque was reduced to 120 ft-lb, which reduced the trouble encountered.

It was felt that this reduced torque would provide adequate rail anchorage for the continuous welded rail. Within a few weeks time it was found that the tension in the clip bolts where treated laminated fir pads had been used had dropped off from one-third to one-half. Accordingly, the clip bolts on both installations have been retightened once out-of-face and some of the clip bolts have been retightened a second time to insure maintenance of adequate bolt tension. The second retightening was required principally where the laminated pads were used. It was anticipated that retightening at these pads would be required periodically until the pads had become fully compressed.

There has been a negligible amount of surfacing or spotting required on the ACL installation to date. On the Seaboard installation, a few locations required spotting and, since a surfacing gang was working in the area, this gang smoothed up the entire test section, tamping about 200 ties.

In both installations, some of the original hard rubber insulating bushings have become crushed or torn and will be replaced with new type Delrin plastic bushings, which laboratory tests have shown to have considerably greater strength.

At the time the Seaboard installation was made, six consecutive ties had SR-4 type electrical strain gages applied to the ties before installation. The purpose was to afford a means of

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Concrete ties cont'd

measuring the stresses that were developed in the ties under regular service trains. These stresses could, in turn, be compared with calculated stresses used in the design of the ties.

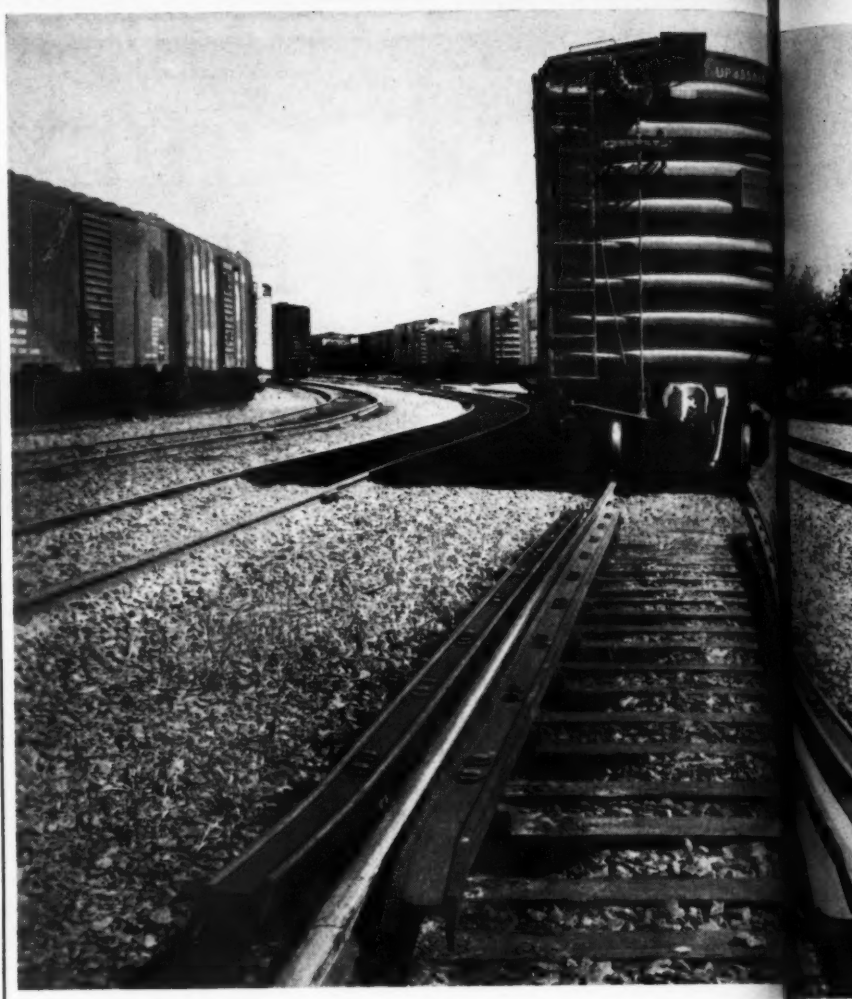
In preparation for taking readings from the strain gages the AAR Research Center mobile laboratory truck was driven alongside the track at the location of the test ties. Two 12-element recording Hathaway oscillographs, giving capability of recording 24 strains simultaneously, were used in making the tests. Tests were conducted under regular scheduled train movements. However, the Seaboard was very cooperative in arranging to control the train speeds over the test section to give a range of speeds varying from 10 mph to 80 mph. The test readings included measurements of the stress in the concrete at the top and bottom of the tie at both mid-length and under the rail and stresses in the bolts, clips and rail. Vertical movements of the rail and tie were also measured.

One unusual incident occurred during these tests. Lightning struck a telegraph pole near the test truck during one of the almost daily storms. The lightning splintered the pole and then jumped across to the truck, blowing out several fuses in the recording equipment, after which it followed the wires to the gages on the rail and ties, destroying several of the gages. Considering that the gages were applied to only six ties out of some one billion ties in track, and that the tests covered a period of only a few weeks, this appeared to be a record of some kind for "height of coincidence." After this incident, members of the test party grounded the pole and test truck to prevent further trouble.

One of the principal purposes of the field measurements was to compare the bending moment provided in the design with the bending moments actually developed under regular service conditions. Although the data have not been reduced, certain interesting characteristics were indicated by a preliminary examination of the test records. For one thing, as the bending moment at mid-length of the tie was positive, there was no evidence of any centerbound condition having developed so far at any of the ties.

The maximum bending moment in the tie resulting from the wheels pass-

(Continued on page 82)



Skates give way to

● A cut of five cars, weighing a total of 337 tons, rolled down the hump of a gravity yard, through the master retarded and onto one of the body tracks. As it neared the far end of the 3000-ft track, and while moving at a speed of 7 mph, the rims and flanges of the forward car were engaged by a device newly installed in the track. The cut of cars quickly slowed and stopped with the trailing truck of the second car and the lead truck of the third car in the retarder.

This movement was one of many tests made to determine the efficiency of an automatic, mechanical retarder that had been developed for use in place of skates at the leaving ends of tracks in retarder yards. In another test the same cut of cars, moving at a speed of 9.1 mph, was stopped with the trailing truck of the fourth car and the lead truck of the fifth car in the retarder.

The mechanical retarder under test was a prototype of a device developed by the Railroad Products Division of American Brake Shoe Company. As a result of experience with the prototype it was decided that worth-while benefits would be realized if the retarder were installed throughout the yard. Consequently, one of the retarders was installed in each of the body tracks at a point about 300 ft from the leaving end.

The retarder, generally supplied in 39-ft lengths, consists of spring-loaded

RETARDERS were installed about 300 ft from leaving ends of tracks. They are usually furnished in 39-ft lengths.

BRAKING effect is produced when retarder rails are caused by spring action to engage wheels of cars.

REPORTS are that the retarder will absorb kinetic energy of cars at rate of 9,000 ft-lb per foot of length.

mechanical retarders in hump yard

rails which apply retarding force simultaneously to both the rim and the flange of each pair of wheels. It is provided in the form of units that are installed opposite each other in the track. Each unit consists of two retarder rails mounted on opposite sides of the running rail and connected by nine spring assemblies.

When a car wheel enters a unit, the retarder rails are forced apart against spring pressure, providing a braking effect on the wheel. It is said that the retarding forces are applied to opposite faces of the wheel in such a way as to eliminate the possibility of a derailment. No difficulty is said to be encountered in moving either the cars or the locomotive through the retarder when the track is being "pulled."

In bringing a moving car to a stop the action of the retarder, it is explained, has the effect of absorbing the kinetic energy generated by the car. It is claimed the device will absorb this energy at the rate of 9,000 ft-lb per foot of retarder length, or 350,000 ft-lb for a 39-ft retarder. Experience is said to have shown that a 39-ft mechanical retarder will stop cars with average loads moving at 7.5 to 10 mph.

Savings, other benefits

In making the retarder installation mentioned above the railroad expected to realize a number of advantages. Similar installations on several other roads are producing estimated annual savings ranging from 30 to 60 per cent on the investment.

These retarder installations are also expected to result in operating benefits. Since the skates had been placed at varying distances from the clearance points—almost in a straight line across the yard—the railroad figures the capacity of the tracks in the yard has been increased by six or seven cars per track.

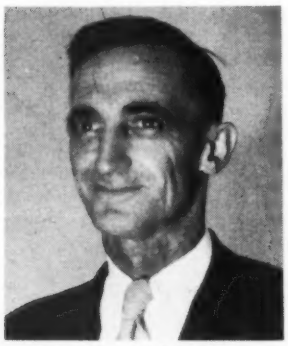
Further, the number of cars per cut is no longer a factor, and trimming, when not entirely eliminated, is speeded up because it is not necessary to remove and replace skates and release hand brakes.

CONVENTION PROGRAMS

Roadmasters' and American Railway

September 19-20-2

Road-masters' Sessions



S. E. Tracy, President

Monday afternoon

(Willliford Room)

2:00 pm—Address by President S. E. Tracy
2:25 pm—Recognition of past presidents by C. E. Neal
2:45 pm—Report of Standing Committee No. 1—Machinery for Maintenance of Way Work, L. G. Lawson, chairman (roadmaster, Canadian National, Melville, Sask., Canada)
3:10 pm—Report of Special Committee No. 4—Supervisory Problems When Deferred Track Maintenance Accumulates, C. A. Hagen, chairman (supervisor of track, Illinois Central, Memphis, Tenn.)
3:50 pm—Adjourn

Tuesday afternoon

(Willliford Room)

2:00 pm—Report of Special Committee No. 1—Rail Inspection and Replacement, W. M. Mowdy, chairman (division engineer, Chesapeake & Ohio, Clifton Forge, Va.)
2:30 pm—Report of Standing Committee No. 3—Roadway, F. N. Beighley, chairman (roadway engineer, St. Louis-San Francisco, St. Louis, Mo.)
3:00 pm—Report of Special Committee No. 2—Organizing for Maintenance of Way Work, O. C. Benson, chairman (asst. engineer maintenance of way, Boston & Maine, Boston, Mass.)
3:30 pm—Announcements and adjourn

Wednesday morning

(Willliford Room)

9:30 am—Report of Special Committee No. 3—Reducing Delays to Work Equipment and Roadway Machinery, W. G. Bailey, chairman (roadmaster, Atchison, Topeka & Santa Fe, El Paso, Tex.)
10:00 am—Report of Standing Committee No. 2—Track, F. E. Huddleston, chairman (general supervisor, track, Chesapeake & Ohio, Huntington, W. Va.)
10:20 am—Business Session
Election of Officers
11:00 am—Adjourn

Joint activities featured

Monday morning, September 19

(Williford Room)

10:00 am—Invocation by Dr. Kenneth Hildebrand, pastor, Central Church
Welcome by presidents of Roadmasters' and Bridge & Building Associations
Greetings from E. J. Brown, president, American Railway Engineering Association
Greetings from Leo E. Flinn, president, Association of Track and Structure Suppliers
Remarks by Ray T. Johnson, Jr., first vice president, AT&SS
10:30 am—Address by B. F. Biaggini, vice president, Southern Pacific, San Francisco, Calif.
11:10 am—Address on How to Be Happy Though Safe by Paul Jones, director of public information, National Safety Council
11:50 am—Announcements
12:00 noon—Adjourn

Supply group has eyes on 1962

By Leo E. Flinn
President
Association of Track & Structure Suppliers

One of the primary purposes of the AT&SS is to sponsor exhibits of manufacturers' products during the annual meetings of the Roadmasters' and B&B Associations. But this doesn't mean that our association is inactive during non-exhibit years, such as 1960. Far from it. In fact, having had the privilege of directing the activities of the association during the past year, I can testify to the large amount of work that has to be done.

Take the annual banquet as an example. To make certain that this will be a memorable occasion for the members of the railroad associations and their families, we must start months in advance to work out the multitude of details involved in making the arrangements. I am sure the banquet to be held during the current meetings will reflect the work and planning that has gone into it.

But this isn't all. Many routine items of business are involved in running an organization consisting of 142 manufacturers. Meanwhile, we must keep our sights on the next exhibition which is scheduled to be held in September 1962. With the objective of making this exhibit the most successful our organization has ever held the decision has already been made to stage it in the new Exposition Center on Chicago's lakefront. And you can be sure that the products to be exhibited will be just as modern as the building in which they will be on display.

Maintenance of Way Association

Bridge & Building Association

Conrad Hilton Hotel, Chicago

by addresses, banquet

Tuesday morning

(Williford Room)

9:30 am—Address by H. C. Murphy, president, Chicago, Burlington & Quincy, Chicago
10:20 am—Address on Public Relations—Responsibility and Opportunity, by J. Handly Wright, vice president, Public Relations Department, AAR
11:00 am—Informal, off-the-record remarks on What I Saw in Russia by Frank R. Woolford, chief engineer, Western Pacific
12:00 noon—Adjourn

Tuesday evening

(Grand Ballroom—Informal)

6:30 pm—Joint annual banquet of the Roadmasters' and B&B Associations—sponsored by the Association of Track & Structure Suppliers. The banquet tables will be numbered and all tickets will bear table numbers.

AREA committee meetings

An unusual number of committees of the American Railway Engineering Association will be holding meetings this year at the time of the Roadmasters' and B&B conventions. A schedule of the meetings follows:

Committee	Date	Time	Room
Roadway & Ballast	9-18	9:30 am to 5:00 pm	PDR 18
	9-19	9:30 am to Noon	PDR 18
Ties	9-21	1:00 pm to 5:00 pm	PDR 2
Rail	9-20	9:30 am to 5:00 pm	Lower Tower
Track	9-20	9:00 am to 5:00 pm	PDR 4
Subcommittee 2	9-19	9:00 am to Noon	PDR 4
Subcommittee 3	9-19	1:00 pm to 5:00 pm	PDR 12
Buildings	9-19	9:00 am to 5:00 pm	PDR 14
	9-20	9:00 am to 5:00 pm	PDR 14
Masonry	9-20	9:30 am to 5:00 pm	PDR 3
	9-21	9:00 am to 5:00 pm	PDR 3
Highways	9-19	9:00 am to 5:00 pm	Par. 25
	9-20	9:00 am to 5:00 pm	Par. 25
Engineering & Valuation Records	9-20	10:00 am to 5:00 pm	PDR 18
	9-21	9:30 am to 5:00 pm	PDR 18
Yards & Terminals	9-19	9:00 am to 5:00 pm	PDR 1
	9-20	9:00 am to 5:00 pm	PDR 19
Economics of Ry. Location & Oper.	9-19	1:00 pm to 5:00 pm	PDR 18
	9-20	9:00 am to 12:30 pm	PDR 1
Contract Forms	9-20	9:00 am to 5:30 pm	PDR 13
	9-21	9:00 am to 5:30 pm	PDR 13
Economics of Ry. Labor	9-20	9:00 am to 3:00 pm	Upper Tower
Waterways & Harbors	9-20	10:00 am to 5:00 pm	Par. 27
Maintenance of Way Work Equipment	9-19	9:00 am to 5:00 pm	PDR 13
	9-20	9:00 am to Noon	Par. 24
Clearances	9-20	9:30 am to 5:00 pm	Par. 29
Waterproofing	9-20	9:30 am to 1:00 pm	PDR 12
Welded Rail	9-20	1:30 pm to 5:30 pm	Par. 28
Nominating Committee	9-19	2:00 pm	Par. 26

B. M. Stephens, President

Bridge & Building Sessions

Monday afternoon

(Beverly Room)

2:00 pm—Address by President B. M. Stephens
2:20 pm—Recognition of past presidents by G. W. Benson
2:30 pm—Report of Committee No. 2—Automatic Heating Plants, W. J. Malone, chairman (office engineer, Grand Trunk Western, Detroit, Mich.)
3:15 pm—Report of Committee No. 4—Application of Prestressed Concrete to Buildings and Bridges, A. I. Atkins, chairman (building structural engineer, Baltimore & Ohio, Baltimore, Md.)
4:00 pm—Report of Committee No. 5—Annual Programming of B&B Work, Joel W. DeValle, chairman (engineer of bridges—system, Southern, Washington, D. C.)
4:30 pm—Adjourn

Tuesday afternoon

(Beverly Room)

2:00 pm—Report of Committee No. 3—Bridge Inspection Procedures by B&B Forces, J. S. Ellis, chairman (supervisor bridges & buildings, Chesapeake & Ohio, Grand Rapids, Mich.)
2:45 pm—Report of Committee No. 1—Outfit Cars Versus Highway Trailers for B&B Living Quarters, H. M. Wilson, chairman (supervisor of structures, Pennsylvania, Chicago)
3:15 pm—Illustrated address on New and Improved Paint Systems for Steel Structures by John D. Keane, director of research, Steel Structures Painting Council, Pittsburgh, Pa.
4:00 pm—Adjourn

Wednesday morning

(Beverly Room)

9:30 am—Business session
9:50 am—Illustrated address on B&B Mechanization on the PRR, by J. W. N. Mays, assistant engineer—structures, Pennsylvania, Philadelphia, Pa.
10:40 am—Election and installation of officers
11:30 am—Adjourn

Inspection shows GM&O is | Getting more life from old

The long timber approaches to the GM&O's bridge across the Black Warrior river were considered to be in early need of renewal five years ago. With the hope of deferring renewal for a period of 5 to 10 years, and also reducing the amount of repair work required, the piling and timbers were treated in 1955 with a penta-in-oil solution. Reported here are the results of a careful inspection made recently to determine the results of the treatment.

MR. HOCKENBERRY examines a pile at the ground line while Mr. Bober looks on.

● Five years ago, the Gulf, Mobile & Ohio was considering what programming was necessary towards repairing approaches to its Bridge MB-73.03. This structure carries the road's single track over the Black Warrior river between Tuscaloosa, Ala., and Northport. The timber approaches had already given 40 years of service and a field inspection had revealed that heavy repairs in rebuilding parts of the bridge would be necessary in early years ahead unless some method was found to slow down the normal deterioration of bridge piling and timbers.

To forestall the need for immediate repairs and with the anticipation of adding 5 to 10 more years service life to the structure, it was decided to give the timbers a special preservative treatment. Undertaken in November 1955, this treatment was carried out under contract by the Osmose Wood Preserving Company of America, Inc., Buffalo, N. Y. It involved the spraying of the exposed wood surfaces of all members with a preservative solution and the injection of the same solution into the piling under pressure where the need for internal treatment was indicated.

The bridge is 3,702 ft long and the timber approaches constitute about 80 per cent of its length. The south approach, 927.5 ft long, consists of 74 panels built in 1915 and the north approach, 2,063 ft long, consists of 156 panels of trestle built in 1914, and one 62-ft deck-girder span. The bridge timbers and piling are of heavily creosoted southern yellow pine. The average height of the base of rail above ground is about 45 ft, although in some locations this height is as much as 65 ft. The bents, of six piles each, are 12.5 ft apart and are capped by 12-in by 14-in by 16-ft timbers supporting a creosoted ballasted deck.

In 1955, most of the original piling were still in service. Specifically, of the 1,452 piles originally driven, 809 were still in position in the bridge. A portion of the creosote had leached out and some of the piling showed need for internal treatment. The bracing and other timbers had checked and

FINGER indicates wood plug driven in hole into which solution was injected in 1955.

NEW BORINGS were made and shell indicator used to gage depth of sound wood.

old timber approaches

split to some extent, accelerating the loss of the original treatment and the entry of fungi. It was then that the GM&O decided to give the structure the Osmose treatment.

An account of the treatment given the bridge in 1955 was presented in the April 1956 issue of *Railway Track & Structures*. This question is now apropos: Did the treatment achieve its purpose? To find the answer, an inspection of the current condition of the structure was arranged with the cooperation of S. A. Cooper, chief engineer of the GM&O. The inspection was made jointly by H. Bober, the road's bridge and building engineer, and S. S. Hockenberry, field engineer for the Osmose Company.

How inspection was made

Purpose of the inspection was to determine the effectiveness of both the internal treatment and that applied to the surfaces of the timbers. To inspect the members internally the notes made in 1955 by the Osmose field men were examined to locate the points that were treated internally. New borings with a brace and bit were made at a representative number of these locations and the conditions encountered were compared with those found in 1955.

That part of the examination made to determine the results of the surface treatment included the making of increment borings at various points. These showed that the surface treatment had penetrated an average of ⅝ in into the wood.

Following the inspection Mr. Bober and Mr. Hockenberry expressed themselves as being in agreement that the general condition of the structure had shown very little change in the five years that had elapsed since the treatment was applied.

In the five year period since treatment it has been necessary to post only one pile in the bridge. The only other work done since the treatment consisted of the replacement of 3 caps, 10 stringers, 23 guard timbers and 44 brace planks. The total cost of the labor and materials required in making these repairs amounted to $3,465, the equivalent of $0.23 per foot of timber bridge per year.

The renewal of the timber portion of this bridge in 1955 would have meant an outlay of approximately $350,000. Thus, through an expenditure of less than $30,000 for the treatment, the serviceable condition of the bridge has been continued. Furthermore, it is expected that several more years of useful service life will be obtained from the structure with minimum maintenance, according to Mr. Bober.

THE APPROACHES are comprised of 230 panels totalling nearly 3000 ft in length.

Bridge members were treated both externally and internally

The Osmose spray treatment for the Black Warrior River bridge consisted of thoroughly soaking the exposed surfaces of the timbers with a pentachlorophenol-oil solution, jet spraying this solution into the checks and splits. For the internal treatment of decayed members holes were bored and the preservative was forced into the defective areas under pressure.

The surface treatment was aimed at an absorption of 0.25 lb of dry pentachlorophenol per cubic foot of wood. The preservative solution consisted of six per cent pentachlorophenol in fuel-oil diluent. Special additives were used in this solution to provide long-term toxicity to termites and other insects, as well as to prevent "blooming" or surface accumulation.

A lead man and two spraymen made up the crew. Before starting a day's work, a moisture detector was used to be sure the wood was dry enough to absorb the solution.

First, the piling was treated externally, with the spraymen starting at the top and working down. For this purpose each sprayman has a "soaking" head at the end of a long pipe which was moved up and down and around the pile until it was thoroughly soaked with the solution. A considerable amount ran down the pile and was absorbed largely by the wood in the lower portion.

When all piles in two bents had been so treated, the spraymen replaced the soaking head with a jet-spray nozzle and treated the caps, sash, sway bracing and girts. As he worked down a bent, the sprayman also sprayed the piles again.

When this was completed, he replaced the head with a fine-spray nozzle and coated the underside of the stringers and the exposed surfaces of the deck flooring and ballast retainers. He also again coated the upper portions of the piles. Two separate fine-spray coatings were applied on the underside of the deck to assure maximum absorption.

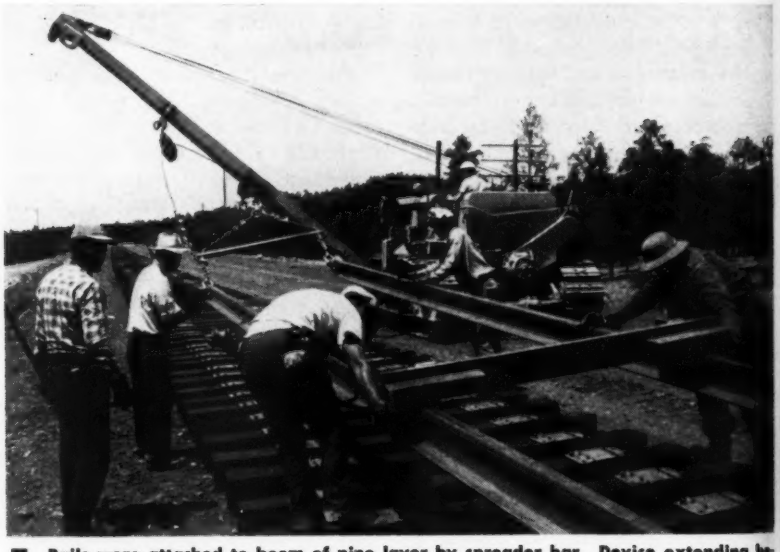
As the work progressed increment borings were made to be certain the treatment was up to minimum specifications.

The internal condition of the members was determined by sounding with a hammer. When decay was found a brace and bit were used to bore a hole into the defective area and notes were made to record the thickness of the remaining sound wood. A hollow bit was driven into the bored hole and the preservative solution was forced into it at a pressure of 80 psi until it showed up on the surface through a check or split. The hollow bit was then removed and the hole was closed by driving a treated plug into it. An average of 50 gal of solution was used per bent.

1 Bundled ties are unloaded by Schield-Bantam crane and placed on sled. Bands are cut and ties are distributed as crane moves ahead. Ties for first track came in trucks; for second track in cars.

2 After being spaced at rate of 24 per 39-ft panel, ties were lined to wire, using template shown at right. Tie plates were fastened to ties with Racor studs before shipment from treating plant.

How Santa Fe is laying 1440-ft rails on big line change



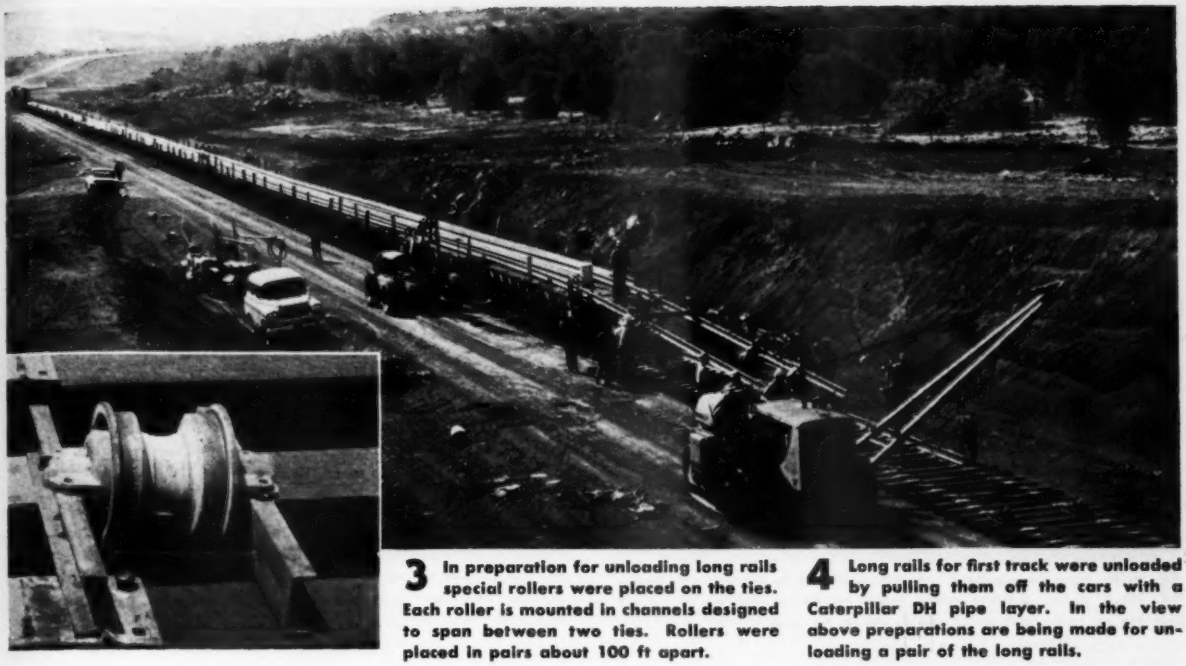
5 Rails were attached to boom of pipe layer by spreader bar. Device extending between rails is a combination spreader and clamp to keep rails from overturning.

The Santa Fe is building a long relocation in its double-track transcontinental main line. Progress has reached the point where the rails—welded into long strings—are being laid. The pictures tell the track-laying story; the text gives general information about the project which is located in northern Arizona.

● Building a new railroad with lengths of rails 1440 ft long presents vastly different problems than when standard-length rails are used.

The photographs on these pages show how the Santa Fe has solved these problems in constructing the trackage for a 44-mile line change it is pushing to completion in Arizona on its double-track transcontinental main line. The long lengths being laid are each composed of 37 standard-length rails butt-welded together by the electric-flash method. Started on July 6, the track-laying work is going forward at the rate of about 1½ miles per day.

The line change is being constructed between Williams and Crookton in northern Arizona at a total estimated cost of $20,000,000. When the job is done, sharp curves, steep grades and limited clearances will have been eliminated, transcontinental trains will have as much as 1 hr 30 min shaved from their running times, and the efficiency of transcontinental operation



3 In preparation for unloading long rails special rollers were placed on the ties. Each roller is mounted in channels designed to span between two ties. Rollers were placed in pairs about 100 ft apart.

4 Long rails for first track were unloaded by pulling them off the cars with a Caterpillar DH pipe layer. In the view above preparations are being made for unloading a pair of the long rails.

6 As rails are unloaded a man stationed at starting point with walkie-talkie set gives signals to operator of pipe layer.

7 After each pair of long rails had been unloaded the rollers were removed by lifting rails slightly with a Speed Swing.

over the route will be improved in other respects.

These benefits will be brought about by improvements in the physical characteristics of the line. The ruling grade, for instance, will be reduced from 1.8 per cent to 1 per cent, and maximum curvature will be reduced from 10 deg to 1 deg. The total central angle of curvature will be cut from 4,614 deg to 1,451 deg. Not only will the reduction in the amount of curvature result in less wear and tear on the track but it opened the way to the use of 136-lb continuous welded rail.

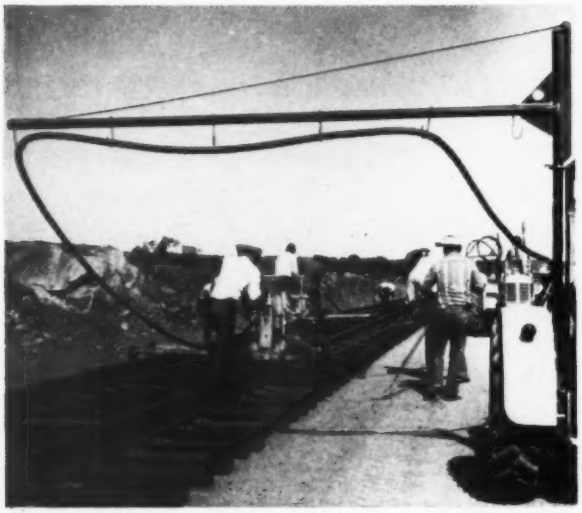
Still other benefits are expected. One of these is the elimination of a tunnel that imposed restrictive clearances. Others are expected to accrue from the traffic-reversal signal system that will be incorporated in the new line. This will enable faster passenger trains to overtake slower freights and, by means of strategically located crossovers, pass and return to their original track without losing speed. The relocated line will be posted for speeds of 90 mph for passenger trains and 60 mph for freights.

The location of the new route was made from reconnaissance on the ground and from photogrammetric topographic maps. A small-scale model of the country was made to demonstrate the advantages of the new route and as an aid in following the progress of the work.

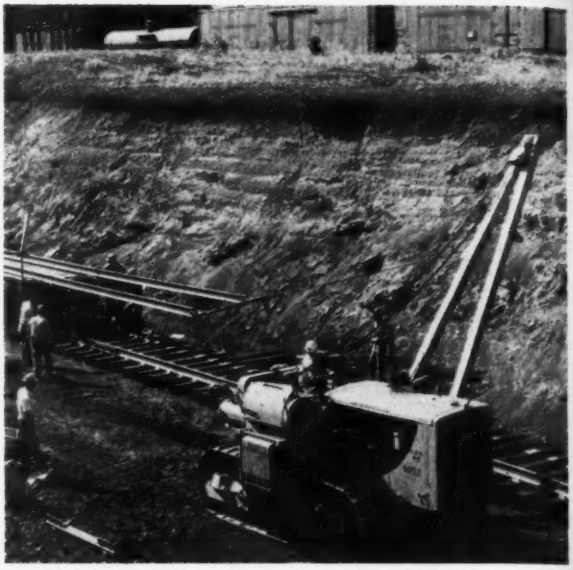
The total amount of material to be moved in grading for the new line is estimated at about 9,000,000 cu yd. In general about 30 per cent of the excavation is in malpais formation and 64 per cent in sandstone and limestone. The remainder is in volcanic cinders and clay.

Photo sequence continues

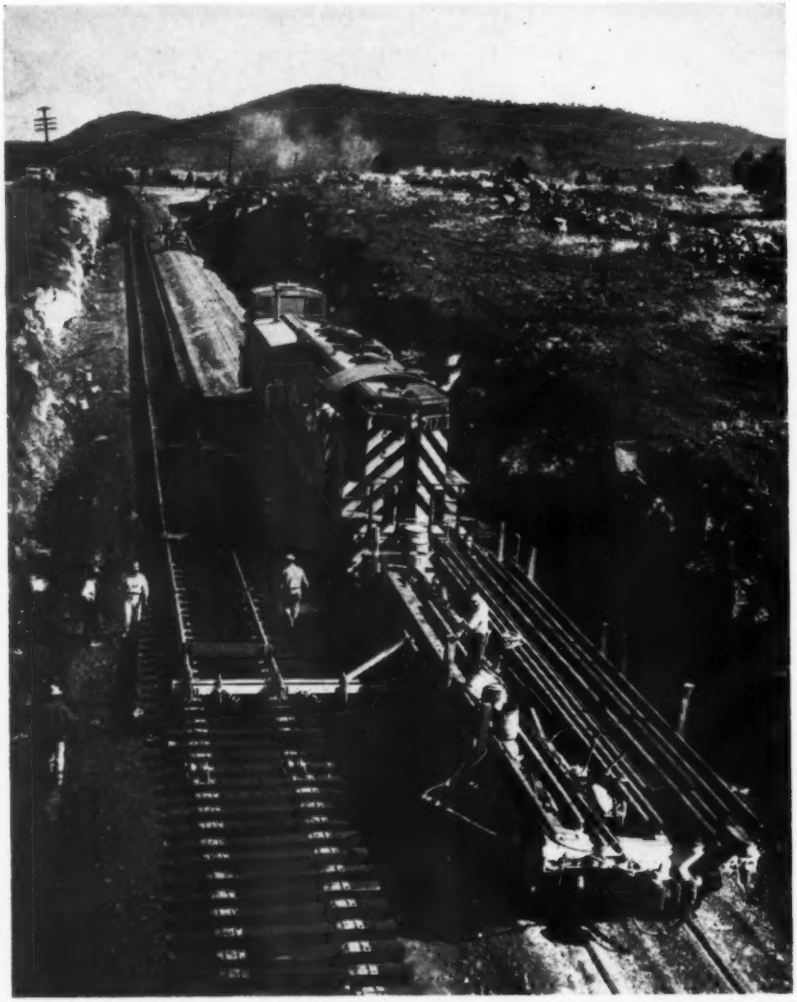
Laying long rails cont'd



8 With rails in position on tie plates two air-driven Racor DD-4 spike drivers were used to drive spikes at every fifth tie so rail train could move up to next unloading position.



9 Pipe layer, with another pair of rails attached to spreader bar, is ready to undertake a new unloading cycle. Average production amounted to about 1½ miles of track laid per day.



WITH ONE TRACK in place the rails for the second track were unloaded by equipment, consisting of a boom car pushed by a diesel locomotive, operating on the first track.

Malpais is a basaltic igneous rock or lava which is hard to blast because of its fractured and honeycombed nature and its varying hardness. Even with modern explosives care must be taken in placing the charges in this formation. If placed in a cracked strata of malpais, or below in loose cinders, much or all of the effective force of the explosives may be lost.

For carrying out the grading work the contractor, Morrison - Knudsen Company, Inc., assembled a force of nearly 600 men and 150 machines. For speed and economy as much material as possible was ripped and dozed by crawler tractors, then push-loaded into scrapers. Where the material encountered was unrippable, drills, powder, shovels and trucks were brought in.

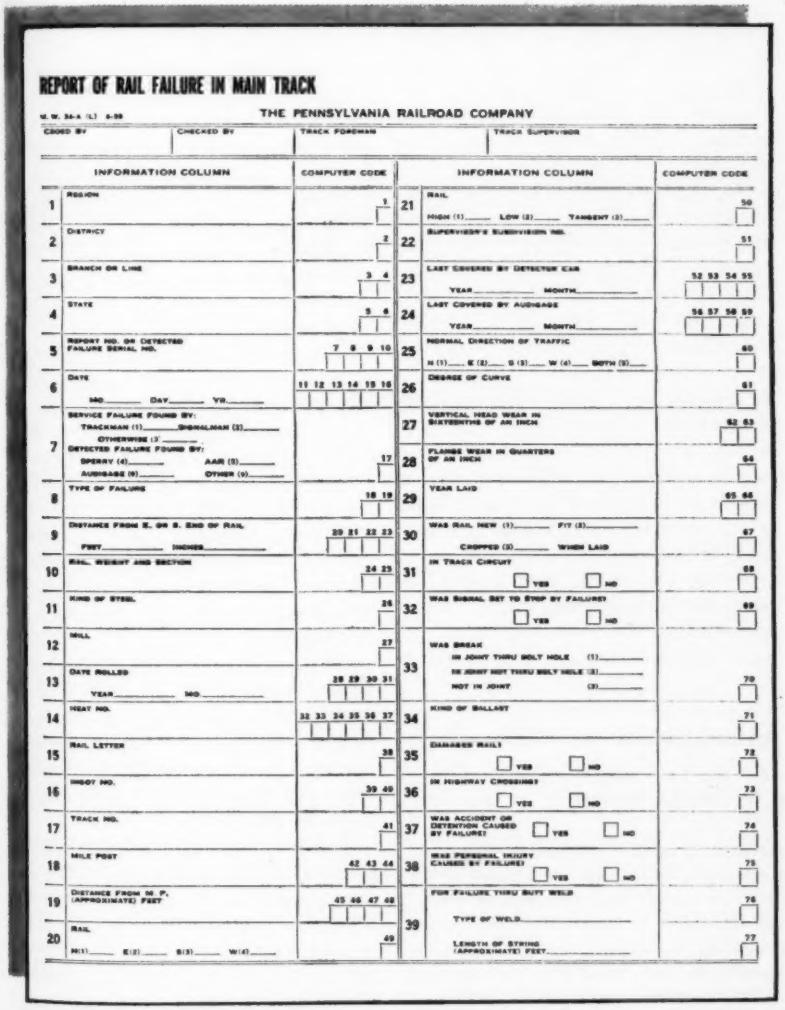
Only two railroad bridges were required on the new route. Each of them is a steel deck-girder structure, one carrying the tracks over U. S. Highway 66 and the other over a road to Williams airport. All other openings will be either concrete-box culverts or corrugated metal pipes. The largest is a triple 16-ft by 14-ft box.

Through rock cuts the top of the subgrade is 42 ft wide. This width includes the normal space for side ditches, which have a top width of 9½ ft each. Through earth cuts the top of subgrade is being built 58 ft wide, which permits a top width of 17½ ft for each side ditch. On embankments, the subgrade is built 36 ft wide.

Puts rail failure data on punch cards

By C. J. Code, assistant chief engineer—staff, Pennsylvania

Since January 1, 1959, the Pennsylvania has been tabulating its rail-failure statistics on the company's IBM 604 machine, using punch cards prepared from data provided on forms submitted by the chief engineer. The primary advantage is that periodical reports are completed much more promptly than before. A secondary advantage, says Mr. Code, is the possibility of obtaining special reports when it is desired to look into some particular phase of rail failures.



REPORT OF RAIL FAILURE IN MAIN TRACK

THE PENNSYLVANIA RAILROAD COMPANY

CODED BY | CHECKED BY | TRACK FOREMAN | TRACK SUPERVISOR

	INFORMATION COLUMN	COMPUTER CODE
1	REGION	1
2	DISTRICT	2
3	BRANCH OR LINE	3 4
4	STATE	5 6
5	REPORT NO. OR DETECTED FAILURE SERIAL NO.	7 8 9 10
6	DATE MO. ____ DAY ____ YR. ____	11 12 13 14 15 16
7	SERVICE FAILURE FOUND BY: TRACKMAN (1) ____ SIGNALMAN (2) ____ OTHERWISE (3) ____ DETECTED FAILURE FOUND BY: SPERRY (4) ____ AAR (5) ____ AUDIGAGE (8) ____ OTHER (9) ____	17
8	TYPE OF FAILURE	18 19
9	DISTANCE FROM E. OR S. END OF RAIL FEET ____ INCHES ____	20 21 22 23
10	RAIL, WEIGHT AND SECTION	24 25
11	KIND OF STEEL	26
12	MILL	27
13	DATE ROLLED YEAR ____ MO. ____	28 29 30 31
14	HEAT NO.	32 33 34 35 36 37
15	RAIL LETTER	38
16	INGOT NO.	39 40
17	TRACK NO.	41
18	MILE POST	42 43 44
19	DISTANCE FROM NO. P. (APPROXIMATE) FEET	45 46 47 48
20	RAIL MFR. (1) ____ E (2) ____ B (3) ____ W (4) ____	49
21	RAIL HIGH (1) ____ LOW (2) ____ TANGENT (3) ____	50
22	SUPERVISOR'S SUBDIVISION NO.	51
23	LAST COVERED BY DETECTOR CAR YEAR ____ MONTH ____	52 53 54 55
24	LAST COVERED BY AUDIGAGE YEAR ____ MONTH ____	56 57 58 59
25	NORMAL DIRECTION OF TRAFFIC N (1) ____ E (2) ____ S (3) ____ W (4) ____ BOTH (5) ____	60
26	DEGREE OF CURVE	61
27	VERTICAL HEAD WEAR IN SIXTEENTHS OF AN INCH	62 63
28	FLANGE WEAR IN QUARTERS OF AN INCH	64
29	YEAR LAID	65 66
30	WAS RAIL NEW (1) ____ FIT (2) ____ CROPPED (3) ____ WHEN LAID	67
31	IN TRACK CIRCUIT ☐ YES ☐ NO	68
32	WAS SIGNAL SET TO STOP BY FAILURE? ☐ YES ☐ NO	69
33	WAS BREAK IN JOINT THRU BOLT HOLE (1) ____ IN JOINT NOT THRU BOLT HOLE (2) ____ NOT IN JOINT (3) ____	70
34	KIND OF BALLAST	71
35	DAMAGED RAIL? ☐ YES ☐ NO	72
36	IN HIGHWAY CROSSING? ☐ YES ☐ NO	73
37	WAS ACCIDENT OR DETENTION CAUSED BY FAILURE? ☐ YES ☐ NO	74
38	WAS PERSONAL INJURY CAUSED BY FAILURE? ☐ YES ☐ NO	75
39	FOR FAILURE THRU BUTT WELD TYPE OF WELD ____ LENGTH OF STRING (APPROXIMATE) FEET ____	76 77

NEW FORM for indicating rail-failure information has been developed in connection with the use of the IBM machine for tabulating rail-failure statistics. Form has space for the usual information plus a column (right) in which coded information is entered. This is the information from which the cards are punched.

● Anyone who has followed the work of the Rail committee of the American Railway Engineering Association realizes that rail-failure statistics are an important guide in assessing the value of changes which are made in rail metallurgy and design.

On a railroad the size of the Pennsylvania, with 13,436 miles of main track, the collection and tabulation of rail failure information is a task calling for the expenditure of a considerable number of man-hours. Following the practice in effect prior to January 1, 1959, individual rail failure reports, Form M.W. 34-A, were prepared by the track foreman for each broken or defective rail removed from track as a result of visual inspection and for each rail removed from track as a result of operation of the rail-flaw detector cars and instruments.

These original reports, prepared in pencil by the track foreman, were typed in the supervisor's office in multiple and two or three copies sent forward, including one for the regional engineer. In the regional engineer's office the information from these reports was tabulated and a quarterly report of rail failures prepared on Form 34-L, showing the failures by types of defects and by rail sections.

The quarterly reports were forwarded to the chief engineer's office and assembled into a system quarterly report and a system annual report. The quarterly reports did not distinguish between service failures and detected failures.

In addition to this, an employee in the chief engineer's office tabulated, from the daily reports of operation of the detector cars, the defective rails located by these cars. At the end of the year he prepared a summary of these detected failures and worked up an annual statistical report, deducting these figures from the total failures reported by the regions to determine the number of service failures.

The annual statistical report included additional information as to miles tested by detector cars, miles of rail in track by sections and by regions, information as to rail purchased and rail laid, and other statistical information of interest to system officers.

In addition to the quarterly reports of rail failures, the regions were required to furnish separate quarterly and annual reports on web failures within joint-bar limits and on the performance of ultrasonic flaw detectors.

Rail failure data on punch cards cont'd

Effective January 1, 1959, arrangements were made with the director of methods and procedures to utilize the IBM 604 machine and supplementary equipment in the data processing office for tabulation of rail failure statistics. This change required preparatory work extending over several months. This work included the design of a new rail failure form.

The new form has space for writing in the usual rail failure information plus a computer code column with numbered squares in which coded information is entered, from which the cards are punched. A master code, including nine typewritten pages, was developed for use in coding reports. This master code includes, among other things, code numbers for regions and districts, code numbers for main and branch lines on each region, rail section and weight, type of failure, kind of steel, the rail mill, direction of traffic, degree of curve, amount of wear, in short, for every item on the 34-A.

The methods and procedures department prepared a manual of Standard Procedure Instructions showing the source and manner of handling of all documents, indicating the responsibility of each office in the chain of reporting, describing, listing, and furnishing samples of all required reports, and providing detailed machine instructions.

How system works

In operation the new method works as follows:

The original 34-A report for service failures and for rails removed from track as a result of operation of ultrasonic flaw detectors is prepared by the track foreman as before, filling in only the information column.

In the track supervisor's office the 34-A is typed in multiple and necessary copies forwarded to the district and regional engineers' offices. In the district or regional engineers' offices an employee who is familiar with the computer code, codes the report, one copy of which is then forwarded to the chief engineer's office. For rail failures located by the detector cars, such as the Sperry car and AAR car, the 34-A reports are prepared in the chief engineer's office, filling in only the answers to the first 20 questions, information for which is available from the daily detector-car reports.

The same employee who prepares these 34-A's from the detector-car reports also receives and checks the reports of service failures from the regions. Shortly after the end of each month the 34-A reports are bundled together and forwarded to the data processing office, where punch cards are prepared from them.

As soon as the data processing office has the 34-A's for the third month of a quarter, quarterly reports are prepared by using the IBM 604 and auxiliary equipment. A quarterly report is furnished for each district showing the failures by rail sections. A system report is furnished showing the failures by regions and another system report showing the failures by rail sections. All the reports are also tabulated by type of failure. In addition, quarterly reports are prepared for web failures in the joint by districts and summarized by regions.

At the end of the year annual reports are furnished covering the same information. In addition to this, an annual report is furnished covering a summary by rail weights of all web failures in the joint and all failures by type of detection, i.e., Sperry car, AAR car, Audigage, etc. Mileage figures and failures per hundred track-miles are included.

Information for the preparation of reports to the American Railway Engineering Association on Forms 402-C and 402-L is also furnished by the data processing office, these reports in their final form being prepared in the chief engineer's office.

As stated, this method has been in effect since January 1, 1959, and the first annual reports were furnished to the chief engineer early during the present year.

Has these advantages

While there have been growing pains involved in such a radical changeover in the method of handling rail-failure statistics, results have been generally entirely satisfactory. The primary advantage is that the quarterly and annual reports are received by the chief engineer much more promptly. When it was necessary to prepare the annual reports from quarterly reports furnished by nine regions, several months delay was inevitable. With the new method, the statistics are available within a few weeks after the close of the period.

The secondary advantage which we consider to be of great importance is the possibility of obtaining special reports when it is desired to look into some particular phase of rail failures. Examples of such reports are given in the accompanying box.

More prompt receipt of quarterly reports has made it possible to check up on discrepancies in the reports, which turn up due to improper reporting of rail failures.

The saving in man-hours is somewhat intangible. Probably more man-hours are expended in the chief engineer's office than by the old method; however, it is generally agreed that there is a saving in man-hours in the regional offices.

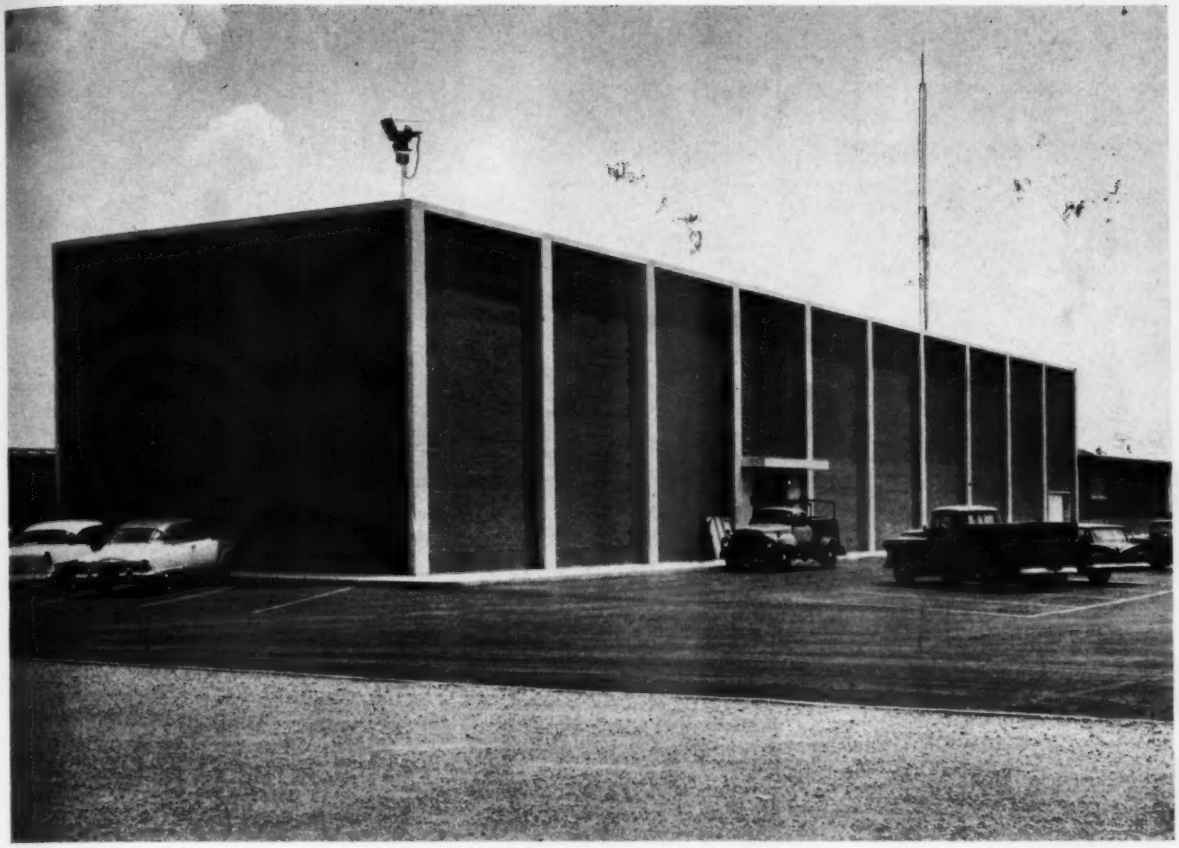
It is anticipated that punch cards for rail failures will be stored in the data-processing office for not less than ten years and that these punch cards will be a source of valuable information in the future when it is desired to make special studies of particular types of rail failures or the results with particular rail sections or from individual mills.

Special reports on rail failures now possible

Mr. Code cites these examples of how the new system of tabulating rail-failure statistics makes it possible to prepare reports on particular phases of the subject:

"About the middle of 1959 it was desired to obtain information as to the numbers of rail failures divided by principal main lines and branches and related to the ages of rails failing. This report was received within a few days after making the request of the data processing office.

"More recently it was desired to determine the number of failures of a particular type in 100-lb rail in a specific branch line. This was also to be related to the age of the rail. The required information, which would have taken many days of work by an employee going through individual 34-A reports, was available within less than forty-eight hours after it was requested."



Flat roof and brick side walls broken only by plain stone trim enhance effect of this . . .

. . . Windowless office building

● "Plain and severe, but contemporary" is the way the Missouri-Kansas-Texas describes the external appearance of the new office building at its Baden yard, St. Louis. These descriptive terms are doubtless prompted by the aspect presented by a flat-roofed, windowless building with exterior walls of red face brick and trim of white stone.

The new office building is part of an improvement program that the railroad is carrying out at the yard, including a new, modern freighthouse, new mechanical building and facilities and other features. The total cost is about $1 million.

The office building is a two-story structure, with each floor having about 6,800 sq ft of space. The second floor will house the executive offices, sales and service department supervisors and the quarters of the chief medical director. The first floor will accommodate the yard office, the freighthouse office and the freight rates department. Adjoining the building are ten acres of asphalt-paved automobile and truck parking areas.

While generally windowless the office building actually does have four windows, three for fire access and one for the yardmaster. Completely fireproof, the building has a high-velocity summer and winter air-conditioning system with automatic zone controls.

Extensive use is made on the interior of aluminum, brick and formica. Partitions are movable and are faced with formica in aluminum frames.

The floors are of reinforced concrete finished with a 2-in thickness of terrazzo. Ceilings are finished with an acoustical material and carry continuous, single-tube fluorescent fixtures with white plastic louvers. The interior walls are of white finished brick. In general, the interior surfaces are said to be hard, durable, waterproof and maintenance free.

A feature of the building is a closed-circuit television system with remotely controlled scanning camera on the roof. The yardmaster can use the closed-circuit TV camera, swinging it in any direction desired, to reproduce any part of the yard on the TV screen in his office.

Other communication features include a pneumatic tube system connecting the various offices in the building, and a radio system allowing communication with train and yard crews.

A special feature of the new office building is an abstract marble mosaic mural, 7 ft by 8 ft, located in the executive office. The mosaic symbolizes railroad transportation in motion, using a human figure woven in with wheels and depicting railroad construction with an abstract design of a railway bridge, track and rail.

Welding plant at Harrisburg dedicated

On July 28 the Linde Company held dedication ceremonies for a fixed butt-welding plant (left) at Harrisburg, Pa. The plant is located near the Steelton mill of the Bethlehem Steel Company in order to be in a position to weld new rail as it comes from the rolling mill. Representatives of the Linde Company, the Pennsylvania, the Bethlehem Steel Company and the City of Harrisburg participated in the dedication. Photo above shows a group inspecting end-finishing machine.

News briefs in pictures . . .

Grinder train for subways

A Speno rail grinding train, specially adapted for subway use, has been delivered to the New York City Transit Authority for grinding rails in the city's 728 miles of tracks. An announcement states the train will grind and smooth out two miles of track an hour and will cover the transit authority's entire subway system twice in its first year of operation.

Dedicate welding plant in Alabama

A fixed plant (left) established by Matisa Railweld, Inc., at Bessemer, Ala., to weld new rails produced by the Tennessee Coal & Iron Division of U. S. Steel at its plant at Ensley, Ala., was dedicated on July 28. In addition to officers of Matisa Railweld, the dedication was attended by representatives of the city, the steel company and various railroads. In the view below a group of those attending the dedication watches the welding machine in action.

ACTION MEMO

ALL REPRESENTATIVES RAILROAD

TRACK MANUAL

DOUBLE SHOULDER RUBBER TIE PLATES

TRACK MANUAL

HI-INSULATING RUBBER RAIL SEAT

TRACK MANUAL

RAILROAD CURVES

TRACK MANUAL

RAILROAD STREET CROSSINGS

TRACK MANUAL

RAILROAD CROSSINGS

TRACK MANUAL

SINGLE SHOULDER RUBBER ABRASION PADS

RAILROADS ARE EXPEDITING THE USE OF THESE . . .

IMPORTANT PRODUCTS

WHICH HAVE CONCLUSIVELY PROVEN

MAJOR REDUCTIONS

IN MAINTENANCE EXPENSE AND CARGO DAMAGE COSTS.

Under the missile train and throughout the nation, Railroad Rubber Products have conclusively demonstrated their amazing maintenance saving ability through cushioning out the destructive forces of shock, impact and vibration from track structures. Railroads are daily discovering these proven methods of extending the service life of all rail equipment and producing a smooth, vibrationless, high speed track that is almost completely self maintained. These products are perfected for every type track structure.

ENGINEERS DISCOVERED HOW RAILS CAN BE LAID ON STEEL OR CONCRETE WITHOUT PLATES OR CROSS TIES

The solution to many expensive track problems on steel decked bridges, in tunnels, on trestles, in subways and under diesel and electrified railroads. Eliminates electrolysis, corrosion, rail creep, shock, impact, vibration and also provides increased head room in tunnels.

LIFE OF RAILS ON SERIOUS CURVES INCREASED 450% BY RAILROAD RUBBER RAIL-TIE UNITS

A remarkable accomplishment that is now producing increased rail life, added safety and tremendous maintenance savings. This type of track construction has made a profound impression and is being used by many railroads.

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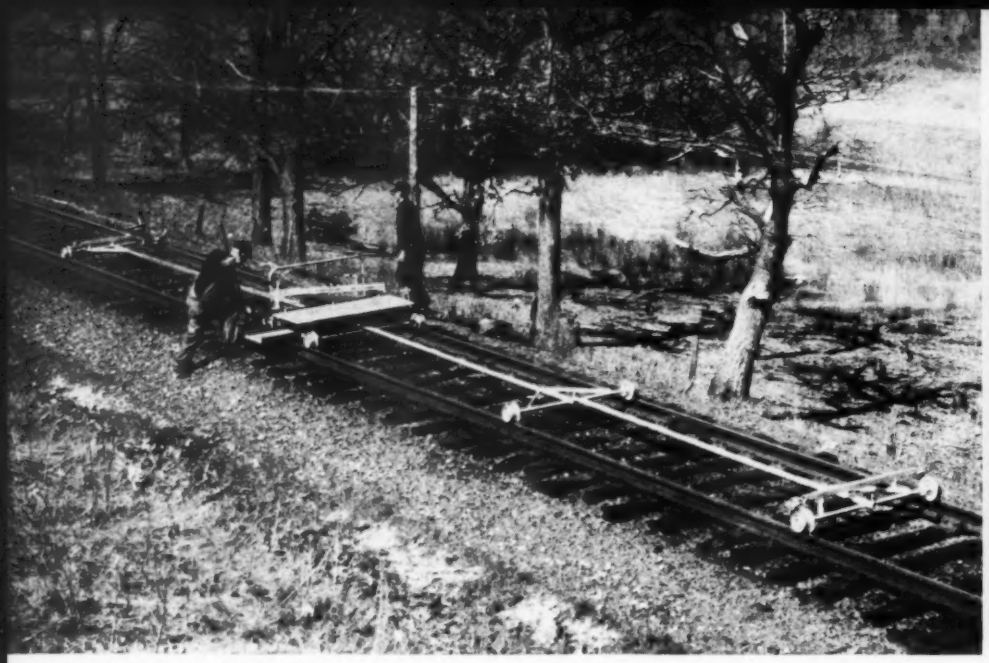


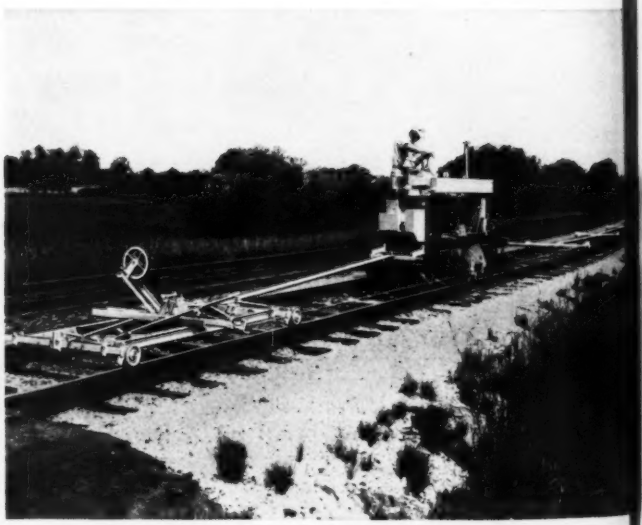
NORDBERG "MIDGET" SURFACER eliminates human error and guesswork by utilizing a 50-ft. length of tautly drawn wire over each rail to locate and correct low spots in track surface.

From NORDBERG . . .

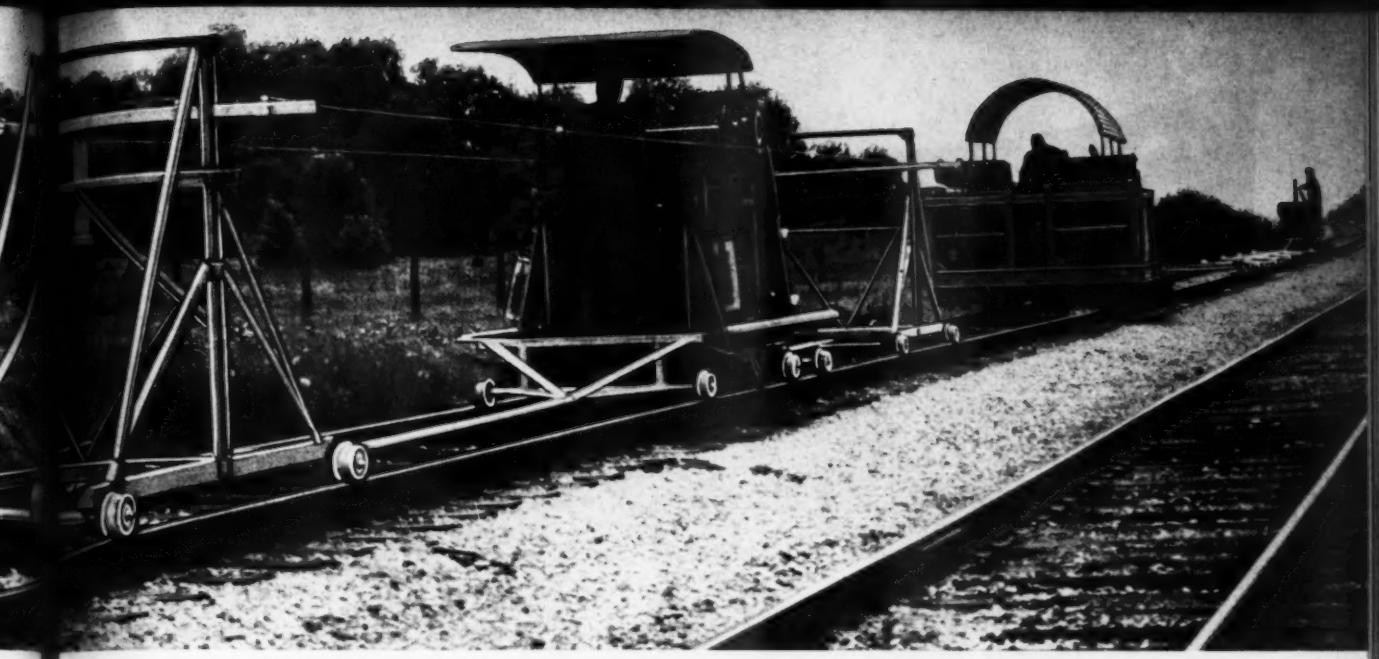
source of the major advancements in railway track maintenance machinery comes the technique of

"ORGANIZED

NORDBERG "TRAK-SWEEPER," used in track raising operations. Unit utilizes a rotating impeller with four radially-mounted heavy rubber blades to level ballast for better distribution ahead of tampers, and to remove excess ballast after tamping.



LINING OPERATION, utilizing the Nordberg Line Indicator with the Trakliner as the central unit, does a complete job of sighting and lining track, using a 120-ft. length of wire to do an extremely accurate lining job.



SMOOTHIN' OPERATION, utilizes the Nordberg Trak-Surfacer—Tamping Power Jack team with shortened wire, Gang Tamper, Line Indicator and Trakliner. With wire lengthened, the Tamping Power Jack—Trak-Surfacer team is used in out-of-face surfacing operations.

D MECHANIZATION"

...with MECHANICAL MUSCLES®

The most efficient way to speed-up and improve track maintenance work and reduce costs in the bargain

"Organized Mechanization" is the most effective grouping of machinery into efficient working teams. The great advantage of "Organized Mechanization" is its application to major railway track maintenance work. Here is a way of making the machines—which are efficient and effective individually—even more productive . . . a way to handle specific maintenance-of-way jobs "better, faster and at lower cost." Inherent in the simple, time proven principle of "Organized Mechanization" are these four significant points:

(1) Single source for all machines;

(2) Each machine is designed and built to work most efficiently with other Nordberg machines;

(3) Maximum parts interchangeability between machines;

(4) Training of operators is easier.

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Mechanical Muscles®

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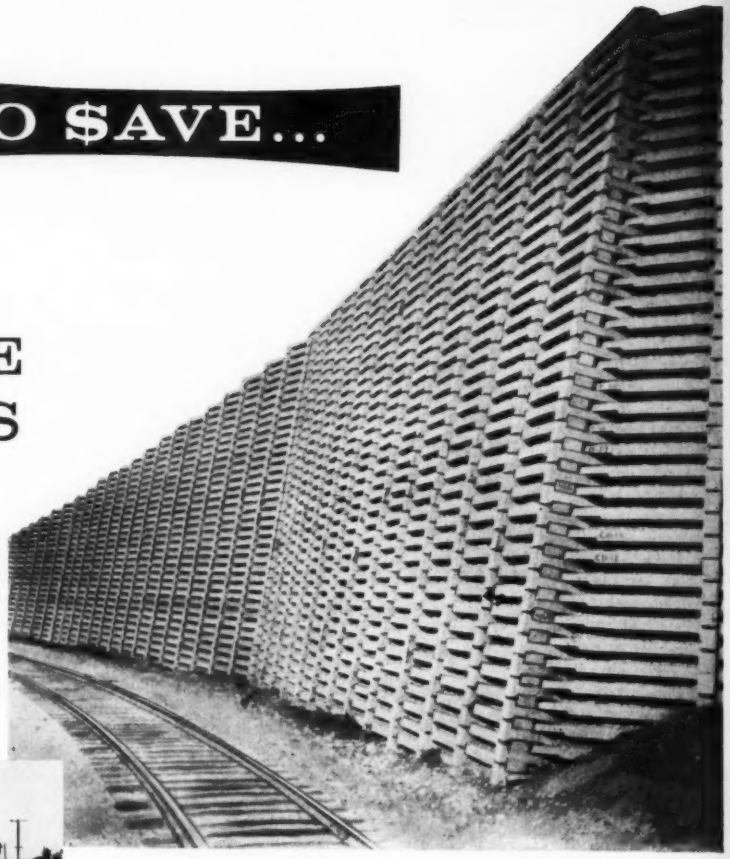
PRECAST CONCRETE PRODUCTS



CRIBBING

Concrete crib walls, because of their economy and adaptability, are the permanent answer to most retaining wall problems. Architecturally pleasing too.

PRESTRESSED RAILROAD BRIDGES

Precast maintenance-free Amdek bridge beams are made under factory controlled conditions, delivered on schedule, erected quickly with minimum traffic tie-up.

CULVERT PIPE

Concrete culvert pipe is permanent. Available in the shape, size and strength required. Has superior hydraulic properties.

A-M

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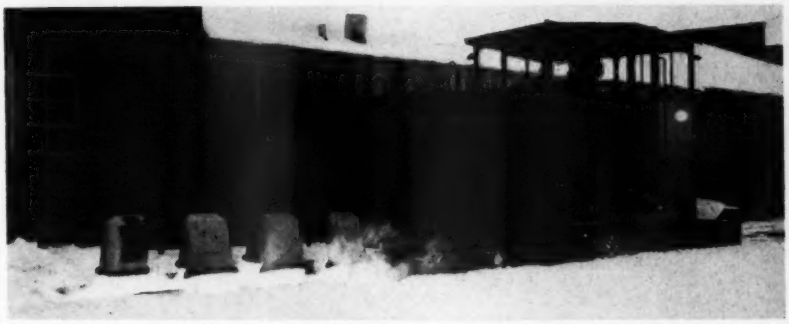
PRODUCTS

An 'exhibit in print' of new and improved equipment and devices

Six burner heads on . . .

New snow melter

THE FAIRMONT W57 Series A snow melter has been announced. The purpose of the W57 is to melt snow at switches in yards during snow storms. The manufacturer states that the construction of the new unit is similar to the Fairmont W55 weed burner except that the W57 has six burner heads, three in each row. The heads are mounted parallel with the track and positioned so that the flame is directed at the base of the rail. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*



Air-cooled engine for . . .

New electric plant

POWERED by a 1-cylinder, 4-cycle K241 air-cooled engine, the new Kohler 2-kw electric plant is stated to be lightweight, compact and economical in operation. The engine is claimed to have ample horsepower (5.6 hp at 1800 rpm) for the rated output and for intermittent overloads up to 2.5 kw. It is equipped with a single-phase generator which supplies 60-cycle ac current at 115 or 115-230 v.

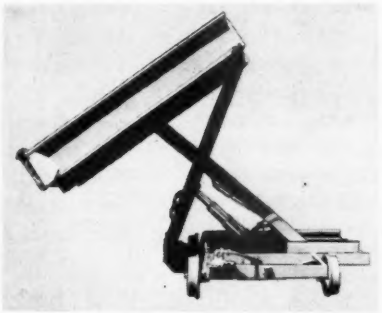
The new 2-kw electric plant is available in models for automatic, remote or manual starting and for gasoline or combination gas-gasoline operation. Standard equipment includes skid-type base, vibro mounts, fuel pump, sediment bowl, fuel filter, oil bath air cleaner and muffler. *Kohler Company, Dept. RTS, Kohler, Wis.*

●

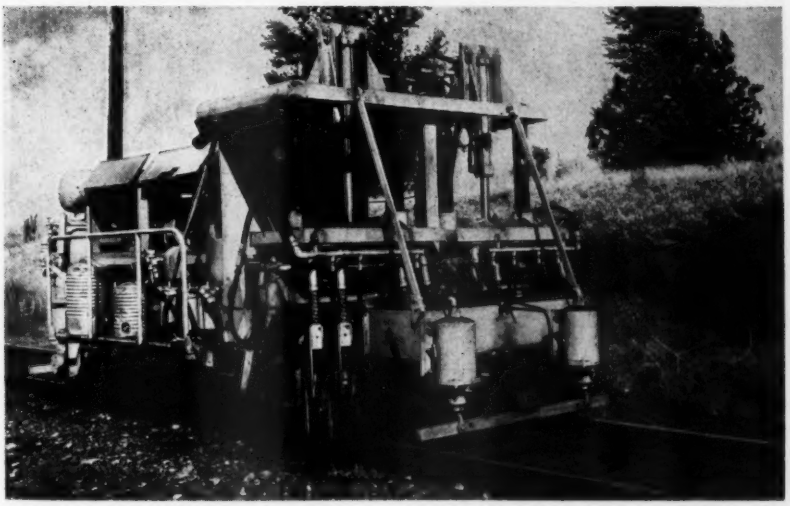
Body can be raised 5 ft . . .

Converto Hi-Dump

MOVED and powered by a heavy-duty motor car, the Hayco Converto Hi-Dump is equipped with a 2-cu yd capacity dump body that is designed to be raised 5 ft in 30 sec. In addition, the dump body is designed to be moved sideways 40 in. in 10 sec. Dumping angle is 30 deg. While dumping the unit is held to the track by quick-acting rail clamps. The sides of the body are 12 in high and the body in the lowered position is 24 in above the top of rail. The maximum recommended load of the body is stated to be 5500 to 6000 lb. The Hi-Dump is built on wheels and axles supplied by the ordering railroad. Power take-offs can be supplied for use with various makes of motor cars. The unit illustrated at left is equipped for a Fairmont A3D motor car.



The manufacturer states that the Converto Hi-Dump was designed primarily to bring material out of a tunnel and dump the material far enough away from the track so that the berm is not fouled. It states that the unit also can be used as scaffolding for scaling or other work in tunnels. *The Brice Hayes Company, Dept. RTS, 6710 Northwest Highway, Chicago 31.*



Automatic features for . . .

Production tamper

A NEW McWilliams production tamper has been introduced which is completely hydraulic except for the tamping tools which are still powered by an air compressor. Previously this machine was all air. The new tamper is equipped with a diesel engine for driving the hydraulic system and a 365-cfm air compressor. The

(Continued on page 56)

only the BANTAM RAIL-ROADER® gives you bonus value like this

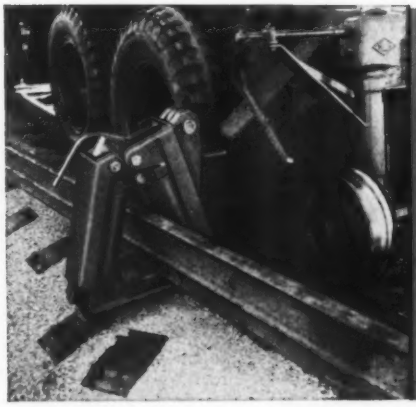
Speeds work schedules . . . gives greater job efficiency . . . reduces equipment costs — ON TRACK AND OFF!

Versatility! That's the bonus value in the BANTAM Rail-Roader! In a matter of minutes the BANTAM Rail-Roader can be converted for either *on*-track or *off*-track performance. You get double the work potential and save the cost of several limited-purpose machines.

Work BANTAM *on* track for redecking, bridge re-stringing, cap changing, rail setting, etc. Work it *off* track for materials handling, building or yard assignments. No matter what your jobs, the BANTAM Rail-Roader handles them better and faster than any other rig in its class.

BANTAM's simplified retractable-wheel design provides easy drive-on or drive-off at any rail crossing. Special high-speed, full-reversing transmission gives BANTAM equal track speeds both forward and reverse. And on the highway it travels permit-free anywhere there is work to be done.

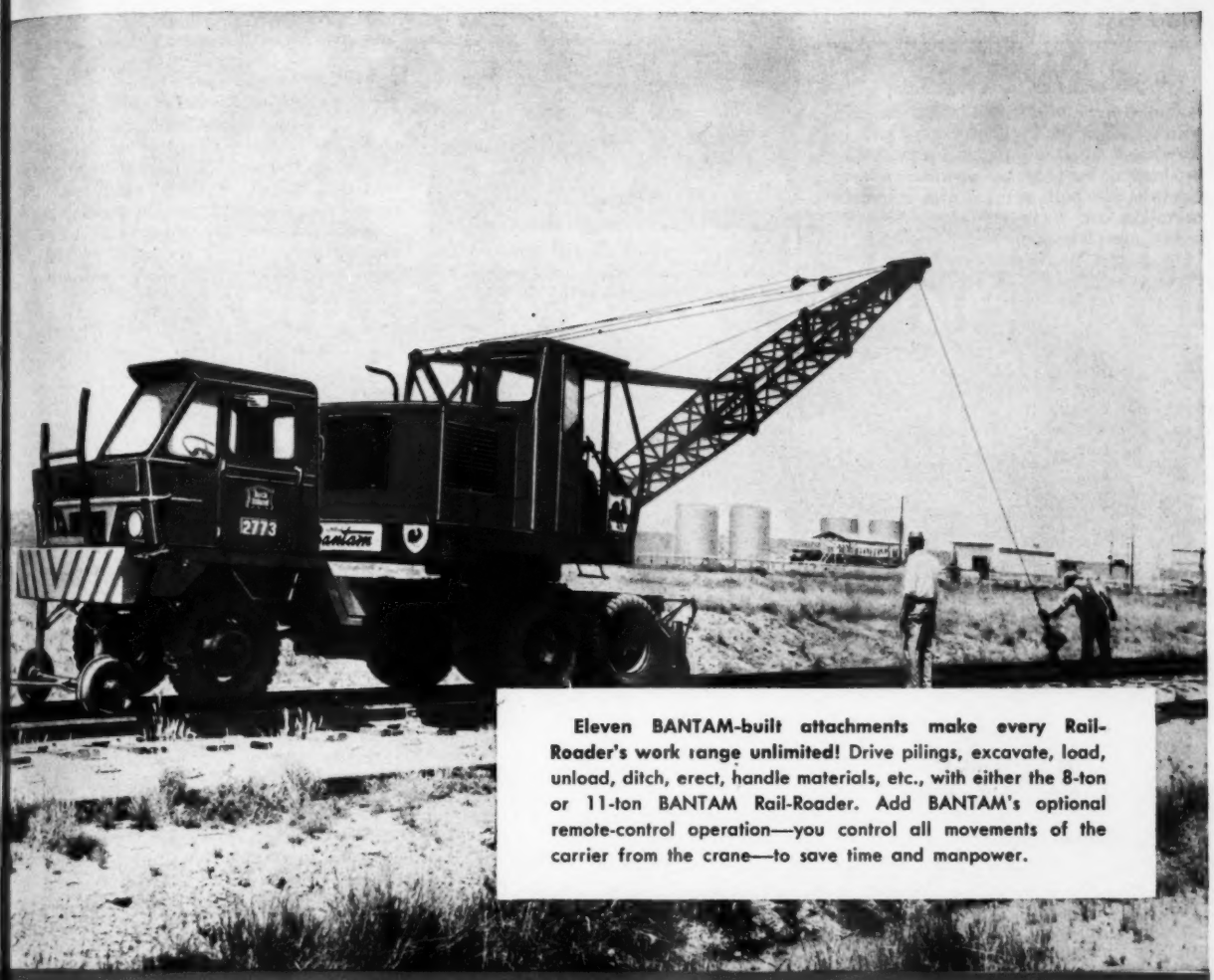
It will pay you to investigate how more and more modern railroads are realizing important savings with the BANTAM Rail-Roader. Ask your BANTAM railroad distributor for the facts—or write directly to us.



Exclusive BANTAM Rail Threader (pat. pend.), mounted on rear outrigger of Rail-Roader, works with second threader carried by hoist line to place ribbon rail on roadbed. Then, in just one operation, Rail-Roader positions new rail to gauge rapidly and smoothly.

BANTAM's unique dolly-wheel mounting eliminates derailing danger when crossing switches, road crossings, etc. Note how tires (front and rear) ride on the rails—eliminating binding and tearing, and giving greater stability, traction and safety at all times.

Self-propelled BANTAM Rail-Roader is ideal for stores departments. Full 11-ton capacity with 1-engine, 1-man operation. Gives unlimited work range in yards, on sidings; travels and works on or off track. Special reverse transmission has speeds to 12 m.p.h. in either direction.



Eleven BANTAM-built attachments make every Rail-Roader's work range unlimited! Drive pilings, excavate, load, unload, ditch, erect, handle materials, etc., with either the 8-ton or 11-ton BANTAM Rail-Roader. Add BANTAM's optional remote-control operation—you control all movements of the carrier from the crane—to save time and manpower.

NOW CHOOSE FROM 2 CARRIER-MOUNTED RAIL-ROADER MODELS—8-TON OR NEW 11-TON CAPACITY

BANTAM offers you a choice of lifting capacities in two great carrier-mounted Rail-Roader models: popular 8-ton size that's performance-proved over miles and miles of tracks on modern railroads, and the new, big 11-ton size that lets you lift more . . . *do* more on hundreds of heavy-duty jobs. Whichever model you choose, you get greater stability and years of rugged service because only BANTAM builds and job-matches both carrier and upper machinery.

NEW LITERATURE

Write for Catalog RR-200, the new, fully illustrated bulletin that gives you complete information, specifications and application photos.

SEE IT—A PICTURE OF VERSATILITY!

Sit down for a showing of one of the color motion pictures of the BANTAM Rail-Roader in action—working on jobs like yours, pointing up typically big savings you can make. Arrange a showing for your B&B or track departments with your BANTAM railroad distributor.

Ad No. RT-266

SCHIELD Bantam Co.

284 Park Street, Waverly, Iowa

World's Largest Producer of Truck Crane-Excavators

(Continued from page 53)

manufacturer states that it is also equipped with an automatic cycling device which incorporates adjustable timers for increasing production by reducing operator fatigue. Controls for both manual and automatic operation are by pushbutton. Tamping speeds are claimed to range from 850 to 1150 ft per hour. *Railway Maintenance Corporation, Dept. RTS, Pittsburgh 30, Pa.*

Improved attachment for . . .

Fork-lift truck

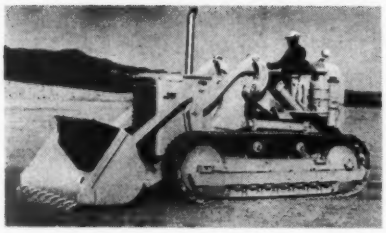
LIFT CAPACITY of the lift arm and pallet fork attachment for the Kwik-Mix Hi-Lifter fork truck has been increased 50 per cent, according to the manufacturer. The attachment now is designed to lift 3000 lb to a height of 35 ft. The manufacturer states that with this attachment the Hi-Lifter has the ability to hoist pallets of brick, block, stone and other building materials to the third-story level of a structure. It is controlled hydraulically. Other attachments include a lift arm and hook with a 2,000-lb capacity, vertical clamp arms of 4,000 to 6,000-lb capacity, ½ and ¾-cu yd capacity concrete hoppers and a 1-cu yd capacity material transfer bucket. *Kwik-Mix Company, Dept. RTS, Port Washington, Wis.*

•

New machine introduced . . .

Traxcavator

ADDITION of the 977 Series H to the Caterpillar line of track-type Traxcavators has been annouced. The new machine is stated to have as much as 25 per cent greater productivity than previous models under average job conditions. It is powered by a 150-hp turbocharged diesel engine and has a new power shift transmission which enables single-lever shifting during all phases of the work cycle. The operator can choose between a high and low work range, each having two gear speeds forward and reverse. The gear selector control lever is



mounted forward of the left arm rest and operates in an inverted "U" pattern. A safety gate lever locks the transmission lever in the neutral position. A 2½-cu yd bucket is now standard, replacing the former 2¼-cu yd bucket.

The 977 H incorporates a new hydraulic system which reduces the bucket cycle time and delivers greater lifting force. The machine has a hydraulic breakout force of 25,500 lb and will lift 17,000 lb to full maximum height. Standard equipment includes a new vertical gasoline starting engine for providing in-seat starting. A 24-v direct electric starting system is available as optional equipment. *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*

Mounts on track machines . . .

Rotary snow plow

AN ADAPTATION of a highway-type rotary snow plow has been developed for use on railroad track. It can be mounted on the Fairmont W55 weed burner, W57 snow melter and W23 Ballast Maintenance Car. The manufacturer states that the new unit has a discharge rate of up to ten tons per minute with a casting distance of up to 40 ft. The plow has a pick-up width of 8 ft 6 in and a cutting height of 30 in. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*

Introduces new 11-ton . . .

Rail-Roader unit

A NEW Schield Bantam 11-ton capacity carrier-mounted Rail-Roader has been announced. The new heavy-duty model is an addition to the company's line of Rail-Roaders which includes 8-ton carrier-mounted and 11-ton self-propelled units. The new model like its predecessors, is equipped with rubber tires for off-track operation and two sets of dolly wheels for operation on the track. The latter are claimed to be quickly raised or lowered and to provide positive traction. When operating on the track the tires on all driving axles ride on the rails.

Other features include a full-reversing transmission for equal travel speeds in either direction, a multiple-speed transmission in the upper works, remote control for one-man operation from the upper unit and an all-vision cab with 360-deg unrestricted visibility. The carrier and upper works can

POWER with a reputation for rugged reliability

Since 1920, Kohler electric plants, powered by Kohler engines, have provided a host of users with reliable, efficient electric power for sole supply, automatic stand-by and marine needs.

Also powered by Kohler engines are many kinds of equipment, produced by numerous leading companies, for use in construction, agriculture and industry.

With long experience in the production of internal combustion engines and electrical generating sets, Kohler Co. emphasizes ruggedness, conservative rating, ease of maintenance, ease of starting. Sales and service nation-wide. Write for illustrated printed matter.

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Enameled Iron and Vitreous China Plumbing Fixtures • Brass Fittings • Electric Plants • Air cooled Engines • Precision Controls

be powered by either gas or diesel engines. Eleven different front-end attachments are available for use with the machine. *Schield Bantam Company, Dept. RTS, Waverly, Iowa.*

For bolts up to ⅝ in . . .

Impact wrench

DESIGNED for hard industrial service, the new Ingersoll-Rand Size 808 air-operated Impactool is claimed to provide 20 per cent more power and 200 per cent faster rundown, and to be 2¼ in shorter, than the tool it supersedes. It is 7¼ in long, weighs 8⅞ lb and handles bolts up to ⅝ in. The new 808 delivers 1100 impacts per minute and has a free speed of 6000 rpm. It is equipped with an air-balanced, rubber-faced throttle valve to provide power assistance for pulling the trigger. The valve is fitted with a replaceable rubber O-ring to eliminate the need for grinding or lapping the valve seat. Other features of the new Impactool include steel hammer case, reverse valve, self-lubricating nylon trigger, adjustable-flow built-in lubricator and simplified socket retainer.

Standard equipment includes a ⅝-in square driver. Optional equipment includes 3, 6 and 8-in extended anvils with ⅝-in square drivers, and quick change anvils for screw driver bits and socket drivers having 7/16 or ⅜-in hex shanks. *Ingersoll-Rand Company, Dept. RTS, 11 Broadway, New York 4.*

●

Improvements made to . . .

Jack tamper

POSITION of the four pneumatic tamping tools and hydraulic jacking cylinders has been changed on the completely redesigned McWilliams jack tamper. The tamping tools are now located outboard the rail and the jacking cylinders located outboard the tie ends. Previously the former were inboard the rails and the latter outboard the rails in the crib. The manufacturer states that the new position of the tamping tools enables easier forking of the ballast when that operation is required and that the new position of the jacking cylinders reduces the tendency to push ties away from the tie plates and rail. In addition, the hydraulic circuit of the machine has been redesigned to speed up the jacking operation. *Railway Maintenance Corporation, Dept. RTS, Pittsburgh 30, Pa.*

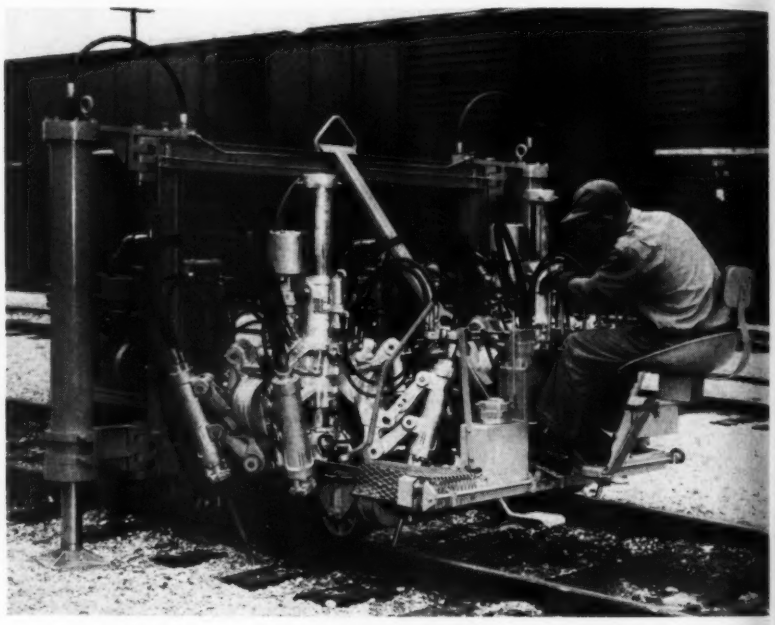
●

New Exoweld method for . . .

Rail welding

A NEW method of welding rails has been introduced. Known as the Exoweld method, it uses preformed disposable molds, welding compound containing aluminum powder, ignition powder, sealing sand, fuses, steel disks and mold clamps. Each mold is contoured to fit standard rails.

To weld rails with Exoweld, the ends are first cleaned and alined. The molds are then clamped in position and sealed with sand. Steel disks are placed in the reaction basin and sealed with sand. Exoweld compound is poured into the reaction basin, after which ignition powder is sprinkled on top. The final step consists of inserting and lighting the fuses. It is claimed that the weld can be made within 10 min after the rails are positioned. When the weld is completed it is cleaned and ground. It is reported that the completed weld is in the same hardness range as the rails and that composition of the weld metal can be controlled to produce any desired hardness or other mechanical property. *Exomet, Inc., Dept. RTS, Conneaut, Ohio; Aluminum Company of America, Dept. RTS, Pittsburgh 19, Pa.*



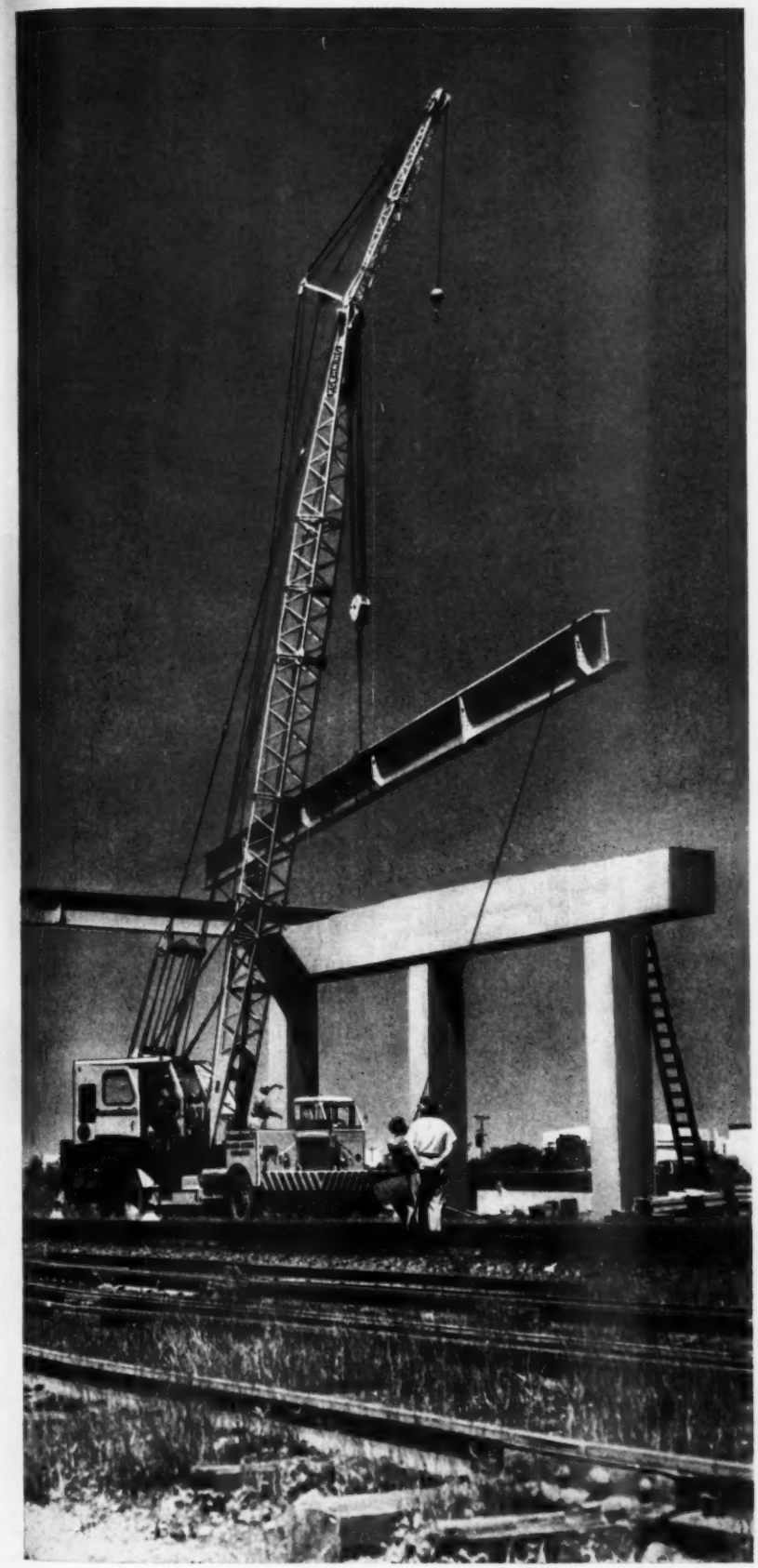
Jacking cylinders for . . .

Oct-A-Gun tamper

EQUIPPED with individually controlled jacking cylinders, the Racine Oct-A-Gun tie tamper can be used for spot tamping, small out-of-face surfacing, and tie-replacement jobs, according to the manufacturer. The machine can also be furnished without the track jack. The Oct-A-Gun is a self-contained, one-man operated, dual-head hydraulic tamper. It has eight tamping guns which are designed to deliver 1160 high-velocity blows per minute to give uniform compaction of ballast while nipping the tie up tightly to the rail.

The manufacturer states that the machine can tamp either end of a tie or both ends simultaneously and that ties are tamped under the rail base as well as out from the rail to a distance of 18 in on either side. Normal production is claimed to be approximately 300 ft per hour. The entire unit is controlled by hydraulic valves that are placed within easy reach of the operator. The machine can tamp through switches due to the operator having full control of the tamping guns, it is claimed.

The Oct-A-Gun is powered by two 18-hp Wisconsin engines which are equipped with 12-v electric generator and starters. Fluid motors are used to propel the machine at a maximum speed of 12 mph and to give fast, accurate start-stop location over ties. The machine is equipped with set-off wheels and can quickly be removed from track on prepared setoffs or at switches, it is claimed. A variety of standard tamping tools is available for various ballast conditions. They are held in place in a simple, quick-acting tool holder. *Racine Hydraulics & Machinery, Inc., Dept. RTS, 2000 Albert St., Racine, Wis.*



Handle scattered jobs in the yard or along the track...

QUICK with a KOEHRING

Speed lifting jobs — speed from place to place — cut handling costs down the line with a Koehring 305 Truck Crane. This versatile rig travels at road speeds up to 36 miles per hour, maneuvers easily around shop or yard to keep material handling flowing smoothly. The 305 is a 25-ton capacity rig — takes from 30 to 100 feet of boom and up to 30 feet of jib. It's heavy duty through and through, built to deliver and keep delivering with minimum maintenance. Ask your Koehring distributor for complete details.

Here's a real mobile crane for close quarter work — Koehring 305 Cruiser Crane. Lifting capacity and boom lengths are the same as the 305 Truck Crane. And this compact unit travels up to 18 mph. under its own power. One man operation — all controls in crane cab.

KOEHRING
DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

K7

Handling miscellaneous work

On roads where track maintenance is being carried out by mechanized gangs, how is miscellaneous work, such as the repair of fences and the cutting of brush, handled? Describe in detail.

Best handled "off-season"

By J. A. Caywood
Assistant Chief Engineer—Maintenance
Baltimore & Ohio
Baltimore, Md.

Miscellaneous work, such as repair of fences and the cutting of brush, is best handled as "off season" work by extra-gang forces. During the months between late fall and early spring, forces are assigned to repair and build right-of-way fences so that they will be in proper condition for the grazing and growing seasons. I might add that a vigorous exploration of fencing obligations is profitable in holding to a minimum the amount of this work it is necessary to perform.

A study of brush-cutting needs should be made to confine this work only to the areas where the growth affects the communication and signal lines, obstructs drainage or the view at public crossings, or is obnoxious or degrading to abutting property. A spray train for applying brush killer will handle the bulk of this work most economically and efficiently. The remaining work should be done by extra-gang forces during "off-season" for general track work, and mechanical brush-cutting tools and machines should be used as extensively as possible.

Should be programmed

By P. A. Cosgrove
Division Engineer
Illinois Central
Champaign, Ill.

The problem of miscellaneous work that must be done on the railroad, such as repairing fences, roadways and street crossings, and handling isolated complaints, such as noxious weeds, etc., is constantly mounting.

Track maintenance can be programmed so that mechanized gangs can take care of the out-of-face work. Some of the miscellaneous work is being deferred rather than being performed. The cutting of brush can be handled on a program basis, using brush-cutting saws and small gangs. It appears to me that the repairing of fences will have to be programmed and handled by a fence gang in the near future because our small section gangs will be unable to keep up with this type of work.

Weed spray is being used to handle some of the worst complaints as far as noxious weeds are concerned and it appears this work will have to be programmed also. I believe we will have to program as much of our miscellaneous work as we possibly can and defer the work as long as we possibly can until such time as a gang assigned to this type of work can get to it.

Would use small, mobile force

By H. W. Kellogg
Assistant Chief Engineer
Chesapeake & Ohio
Richmond, Va.

It is the trend on practically all railroads to carry out programmed maintenance work, such as installation of ties and surfacing, with specialized mechanized forces. These operate on a division basis or a system basis. They perform much of the work that was formerly done by section crews, permitting these crews to be converted into more or less a track-patrol

(Continued on page 64)

NEW QUESTIONS to be answered in December

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you wish your name withheld, we'll gladly comply.

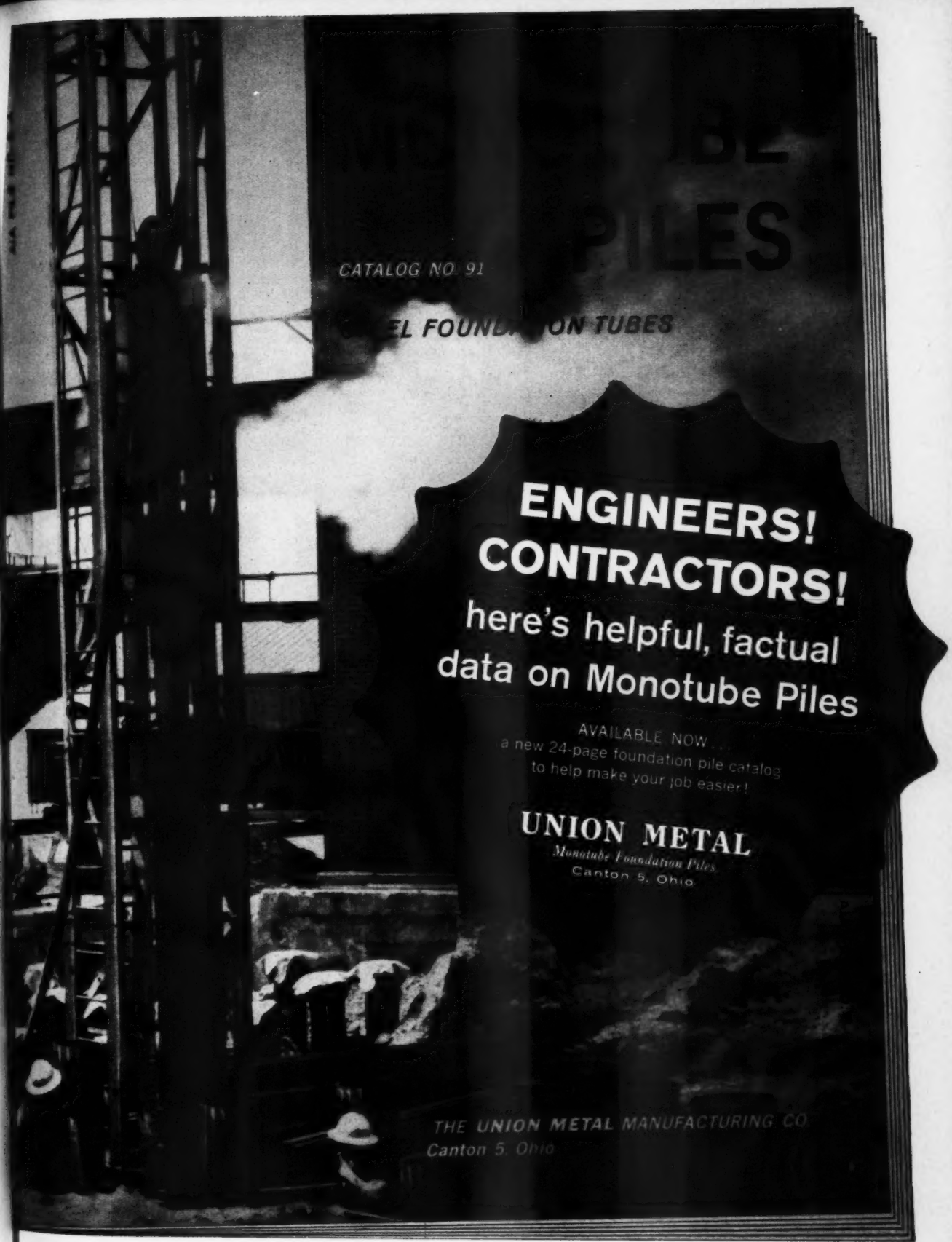
DEADLINE: October 31

- 1. What causes crossties to slew enough to result in tight gage? Explain. How can this condition be corrected?
- 2. Under what conditions is it advisable to drive "helper" piles in a bent of a timber bridge? Explain. How is this done? What is the maximum number of such piles that should be used?
- 3. For an out-of-face tie-renewal and ballasting job, should new spikes be used on all new ties? Why? When gaging track in connection with this work, what percentage, if any, of new spikes should be used on remaining ties? Explain. Does practice vary between single and double track? Why?
- 4. What, if anything, should be done when the lower ends of both the diagonal bracing members of a timber bent are so decayed that the bolts are ineffective? Explain. How long can such work be deferred? Explain.
- 5. What classifications do you have for rail picked up after a rail-laying project? What are the determining factors for these classifications? Explain. Is the rail classified in the field or at the stores department?

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.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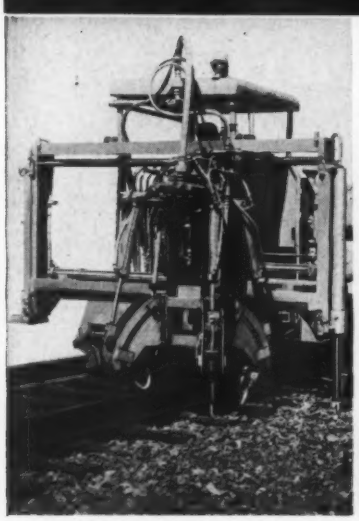
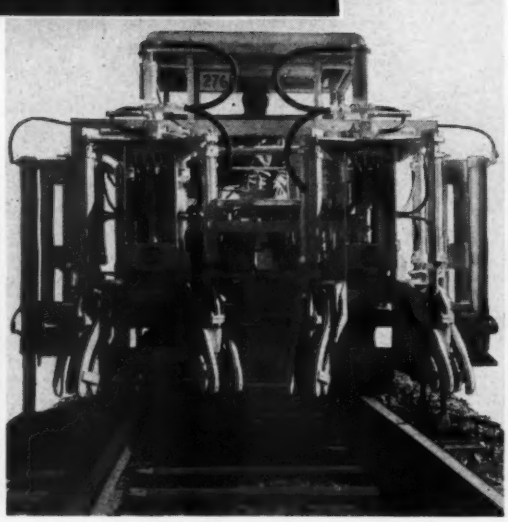
IN TRACK MAINTENANCE . . .

These Jobs* are Done Best by RMC MACHINES

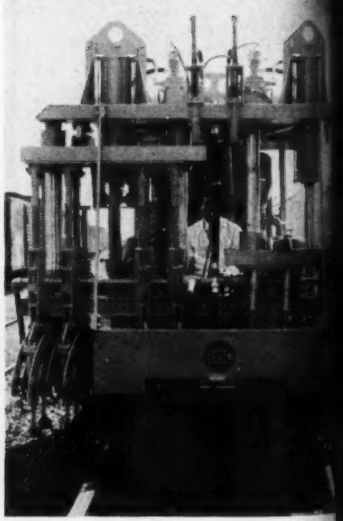
* TIE TAMPING



McWILLIAMS SPOT TAMPER
Big-tamper ballast compaction for smoothing, spot surfacing, yard and terminal maintenance.

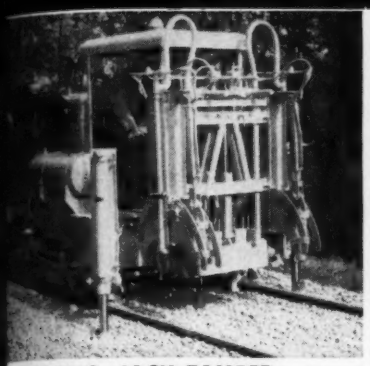


McWILLIAMS MULTI-PURPOSE 8
This is the world's most versatile tamper —a production tamper, a spot tamper, a jack tamper.



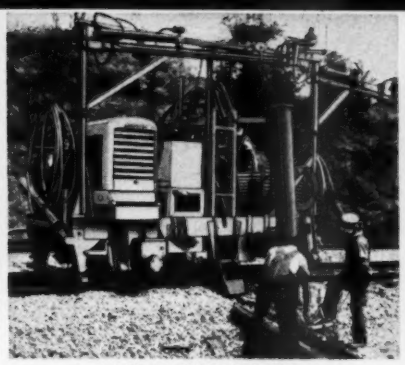
McWILLIAMS PRODUCTION TAMPER
Will finish tamp any raise up to 6" at speeds up to 720' per hour.

* JACK TAMPING * TIE REPLACING * TIE SPACING



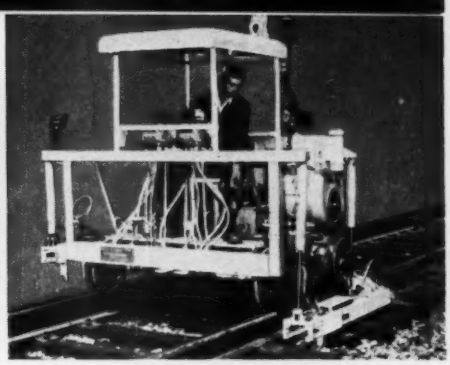
R. M. C. JACK TAMPER

Only machine that will raise and tamp track . . . and hold established grade, keeping ahead of one or two production tampers.



R.M.C. TIEMASTER

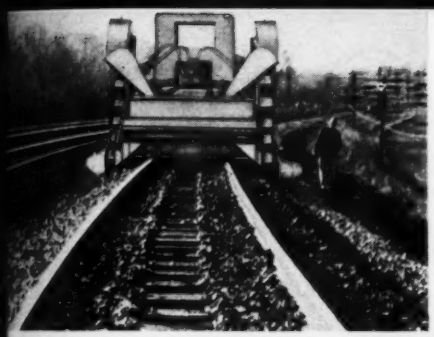
Replaces ties at a rate of approximately one per minute with three men, with minimum track disturbance.



R.M.C. TIE SPACER

Corrects poor tie spacing and slewed tie conditions by means of two hydraulic shifting devices.

* DISTRIBUTING BALLAST * CLEANING BALLAST

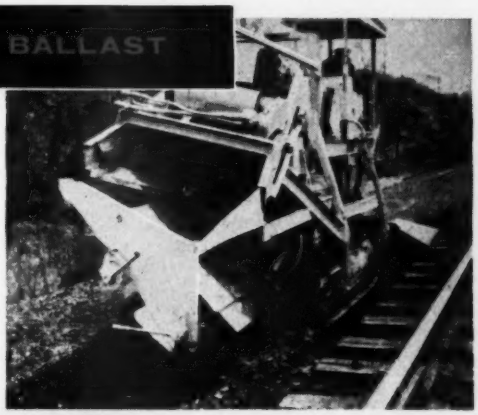


McWILLIAMS BALLAST DISTRIBUTOR

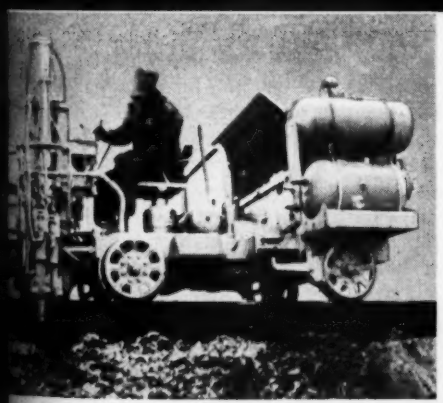
Cleans ballast and places it in desired quantity, in exactly the proper position for tamping—shaping shoulder and inner-track space.

McWILLIAMS SUPER MOLE

Cleans or excavates shoulder ballast at speeds up to 2400' per hour.



* DRIVING SPIKES * LINING TRACK



R.M.C. SPIKEMASTER

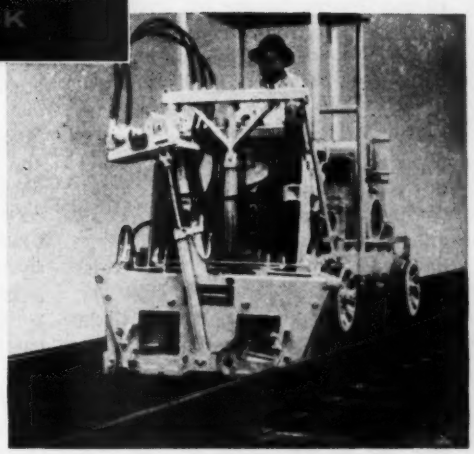
Nips up the tie and drives four spikes, one on each side of both rails. Speed: better than six ties per minute.

R.M.C. LINEMASTER

Lines over 6000 feet of track per day, using an operator and one man sighting. Wheel-mounted and crawler mounted models.

RTI

Trial and LEASE Plans



Railway Maintenance Corporation

PITTSBURGH 30, PA.

What's the answer? (cont'd)

(Continued from page 60)

force consisting of a foreman and one or two men.

With such an organization, it is my opinion that the ideal set-up would be to have on each supervisor's territory a small mobile extra force, or perhaps two, depending on the length of the supervisor's district. This force would consist of about 10 men and a foreman and would take care of miscellaneous work, such as cutting brush, repairing fences, cleaning right of way where necessary, and taking care of drainage and miscellaneous jobs; also, it would do spot smoothing where necessary.

With such an organization, the supervisor would be able to plan his routine maintenance work and have the force at the point closest to where the work will be performed. This would eliminate much of the travel time that is required when there are long sections and men have to spend in the neighborhood of between two and three hours per day traveling. This unproductive time is very expensive and should be eliminated as much as possible.

I feel that such an organization would be flexible and, also, would give more stabilized employment to track forces than they now enjoy in many instances. I feel that we should work towards stabilized maintenance-of-way forces, as the old system of working a large extra force during the summer months and laying it off in the winter is no longer economical.

On some railroads, the maintenance-of-way agreement does not permit trackmen to build fences. When this is true, it is necessary to continue to have a fence force which could either work on a division or system basis to take care of the fence work when and where required. However, by careful planning, I believe it will be found that much of the fence that has been maintained in the past can be eliminated.

Brush control, in most instances, can be accomplished by the use of brush spray chemicals which, if used properly and often enough, will, in time, obtain complete control of brush. However, in some states where the laws require the right of way to be cleared of all combustible material each year, regardless of the use of brush spray, it is necessary to clear and burn the property. The small mobile extra force of the supervisor can be utilized for this purpose during the winter months.

Each railroad, and each division and district of each railroad, presents a different problem and the separate problems should be carefully analyzed by the maintenance of way officers in order to arrive at the most satisfactory solution and make the most efficient use of the labor allotments available.

Suggests specialized gangs

By H. C. MINTEER
Division Engineer
Chicago, Milwaukee, St. Paul & Pacific
Milwaukee, Wis.

On roads where track maintenance is carried out by mechanized gangs, with the subsequent reduction in regular section forces, miscellaneous work, such as repair of fences, cutting of brush and repair of highway crossings, should if at all possible be done by mechanized forces organized primarily for each type of work.

In some sections of the country, section forces cannot hope to cope with rapid growth of brush. Therefore, brush cutting should be done with power-driven brush cutters and the cutting followed with a suitable chemical which will retard future growth. The force organized for brush work should be mobile so that the work can be progressed economically.

Fence repair presents a greater problem in that railroads are required by state laws in most states to provide adequate fences along their right-of-way boundaries. In the past most fences were built with untreated posts and either barbed wire or woven-wire fencing. Over the years these untreated posts have rotted off and so most roads are faced with a constant expensive repair job.

In order to progress fence building work, a fence gang equipped with trucks and housing trailers and a post-hole digging machine should be organized. With this type of equipment, the gang will be mobile, have transportation for the fencing materials and be able to progress the fence-building work more economically than if it is done by the regular section forces augmented with additional manpower. When regular forces are augmented to do fence work either the fence work or regular track work suffer and neither progresses satisfactorily.

Highway crossing repair work falls in about the same category as fence repair work. With the increase in highway traffic and in view of the multitude of highway crossings, railroads are faced with a mounting and most expensive maintenance problem. Formerly, highway crossings were contructed of untreated planks or with a combination of plank and blacktop, or balled-in rail and blacktop.

These types of crossings used to provide a good roadway surface with fairly long life. With the increase in volume and weight of highway trucks and vehicles the plank and blacktop crossings do not give adequate service life for heavily traveled crossings. Therefore, most roads have gone to one type or another of prefabricated full-depth highway crossings.

Proper installation of these newer types of crossings requires a special gang organized for such work. This gang should be provided with mechanical tools for tamping the track and installing the crossing slabs. When a crossing is to be worked, the gang should do a complete job, including renewal of the ties and ballast, possibly installation of welded rail through the crossing, and correction of any drainage problems in the vicinity.

Uses small, mechanized gangs

By R. R. GUNDERSON
Engineer Maintenance of Way
Western Maryland
Baltimore, Md.

The use of mechanized gangs for track maintenance has posed some interesting problems in keeping up miscellaneous work. Our principal track maintenance—out-of-face surfacing and replacement of ties within these limits, and the laying of rail—is handled by a mechanized gang working within the limits of a division. We also have other small division work forces to handle major drainage, roadbed work and ballast cleaning.

Our railroad passes through a seacoast area, a piedmont area and mountainous areas. We have heavy snowfall in many sections and heavy rainfall. Slides occur in some sections, and work caused by these conditions is not uncommonly of an emergency nature. We, therefore, have small extra-gang forces working out of headquarters and covering assigned territories. These forces are substantially mechanized and equipped with trucks for

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You can build safer, smoother roadbed, faster and at lower cost, by mechanizing your anchor installation with a Racine "Anchor-Fast" anchor applicator. This fast, on-track machine saves at least 48 man-hours daily... saves hundreds of hours if you normally use your entire gang to "close up" at end of a day. It's one-man operated... applies Fair, Gautier, Woodings, Tru-Temper, Unit, M&S and Reliance anchors hydraulically, *per anchor manufacturers' specifications.*

Presses anchor to tie for positive grip

For unequalled track stability, "Anchor-Fast" presses each anchor or pair of anchors against tie with 1000 lbs. of pressure... then locks them firmly on base of rail with hydraulically operated tool. This tight fit between tie and anchors holds rail firmly... stops movement under quick temperature changes and heavy traffic.

Fast start-stop hydraulic motor propels "Anchor-Fast" from tie to tie... or moves it to and from job or switch at speeds to 15 mph. Machine is powered by a 11.2 hp gasoline engine... can be set-off or turned around on tracks in minutes with built-in power lift in center of machine.

Send coupon for free demonstration

Clip and mail coupon for location where you can see "Anchor-Fast" anchor applicator at work... or check for literature on any time-saving Racine machine.

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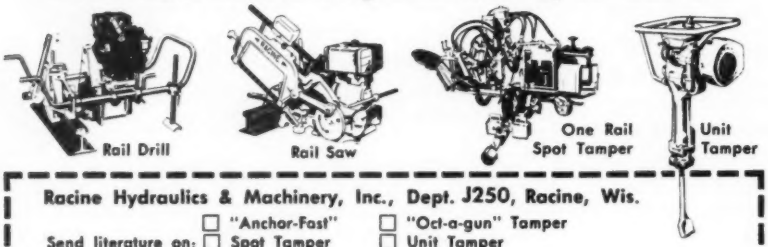

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What's the answer? (cont'd)

most transportation and hauling needs. These forces, while small in number of men per mile of track, are so organized that miscellaneous work arising in their territories is handled as a routine matter.

The term "mechanized gang" is usually associated with a large force equipped to perform out-of-face work. Concentration of effort toward this application can easily obscure the benefits that are obtained from relatively small work forces. It is increasingly rewarding to extend mechanization into the small "scatter" or "bucket" gangs. The more this is done, the more easy it will be to handle "miscellaneous" work in the most efficient and economical manner.

Straightening tilted piers

Is it praticable to straighten masonry piers or abutments which have developed a tilt? If so, how can this condition be corrected? If not, explain why.

Only if tilt is extreme

By M. SCHIFALACQUA
Designing Engineer
Reading
Philadelphia, Pa.

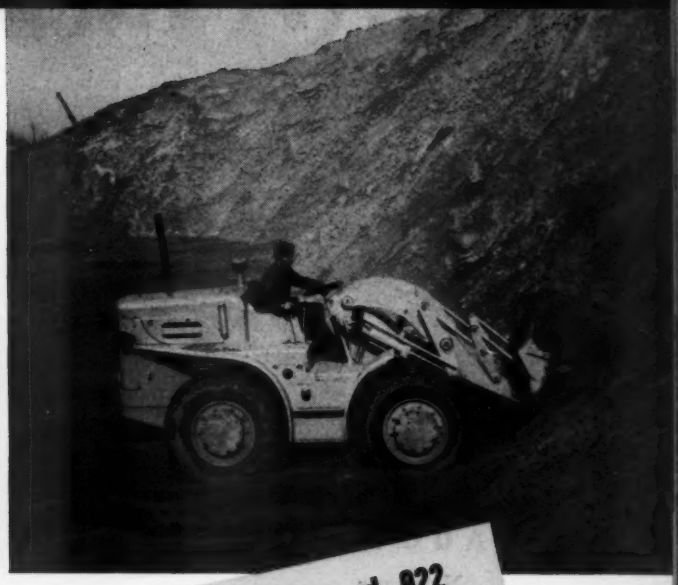
The amount of settlement or tilt, the size and type of structure, the cause, and the conditions at each location will determine to a considerable degree the most feasible and economical method applicable to remedy piers and abutments which have developed a tilt. No specific action can be recommended for all cases, but each case should be decided on its own merits. Thorough and complete investigation to determine the cause of settlement and tilting is important.

Where the use of the structure must be interrupted, the renewal or straightening of piers or abutments is seldom justified economically except in cases of extreme tilt where reconstruction or straightening is the only alternative.

In case of extreme tilt, reconstruc-

MORE NEW TRAXCAVATORS

THE 2¾ yd. 966



THE 1¼ yd. 922

NOW THREE WHEEL LOADERS...BIG IN EXPERIENCE

Now there's a Caterpillar wheel loader for your job—the new *2¾ yd., 140 HP 966* for high production where you measure time in tons loaded—the *2 yd., 105 HP 944* introduced this spring and already gaining an acceptance unmatched in machine history—the new *1¼ yd., 80 HP 922* with the big machine operating and safety features that give it the speed and versatility to handle all those jump-and-run jobs.

There's a seven-year history of testing, torturing and working these Traxcavators . . . proving every component, every feature. They've been on tough jobs all over the country with field engineers watching every cycle, recording every strain.

Now Caterpillar's full line of wheel loaders is proved and ready for work—ready without compromise. They'll fulfill all your expectations of the most advanced wheel loaders on the market today.

See the one man with all the facts on the new Traxcavators—your Caterpillar Dealer. He can give you the full story on the wheel loaders that are brand new in features.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

The 966 and 922 have all these features introduced by the 944:

Cat Diesel Engines – Turbocharged for efficiency and quick acceleration.
Optional gasoline engines for the 922 and 944.

Cat Power Shift Transmission – gives instant shifting, forward and reverse, 1st and 2nd speeds. High and low range selector also provides two-wheel drive for roading, four-wheel drive for power and traction in work cycles.

Operator Safety – Lift arms and cylinders are forward of the operator and cockpit. Visibility is excellent and access is easy . . . up three wide steps.

Long Reach – With the lift arms up front, the dumping reach of the new Traxcavators is impressive: 57" on the 966, 51" on the 944 and 41" on the 922.

Operator Conveniences – Bucket controls have automatic positioners to speed every cycle; machine controls are all power boosted for easy operation. Dual brakes give operator choice of braking with or without transmission engagement.

Full Line of Attachments – Special material buckets, side dump buckets, forks, cabs, etc.

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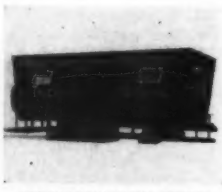
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tion is advisable because of the many influencing factors, precautions to be taken, and the possibility of not achieving the proper and required results in the straightening process. At abutments where channel encroachment is not a factor, the installation of buttresses is feasible and economical.

In cases where tilting is not excessive, measures to insure stability can be readily achieved by normal methods, such as underpinning, jacketing, increasing the depth of the footing, compaction or solidification of the soil, draining the site if applicable, and constructing a spread footing.

Sound judgment and broad experience are required in deciding upon the plan best adaptable to the situation.

Using an increment borer

What is the proper procedure when using an increment borer for determining the soundness of timber? Describe in detail.

At right angles to wood

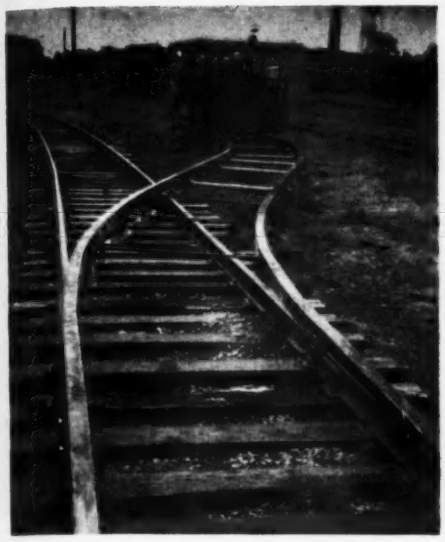
By JOHN W. STORER
Manager, Railroad Division
Osmose Wood Preserving Co.
Madison, Wis.

An increment borer can be a very useful tool for determining the internal condition of bridge timbers and communication poles. Its greatest advantage is that a core is extracted from the wood so that a detailed examination can be made. The core can be examined visually in the field, and if further investigation is required, it can be sent to the laboratory for detailed analysis.

How to use borer

When using an increment borer, it is important that borings be made at right angles to the wood. This assures proper cutting by the leading edge and will result in a good specimen that remains in one piece. If boring southern yellow pine that has been in service, difficulty in starting the borer may be

TPC PORTABLE SIDE TRACK



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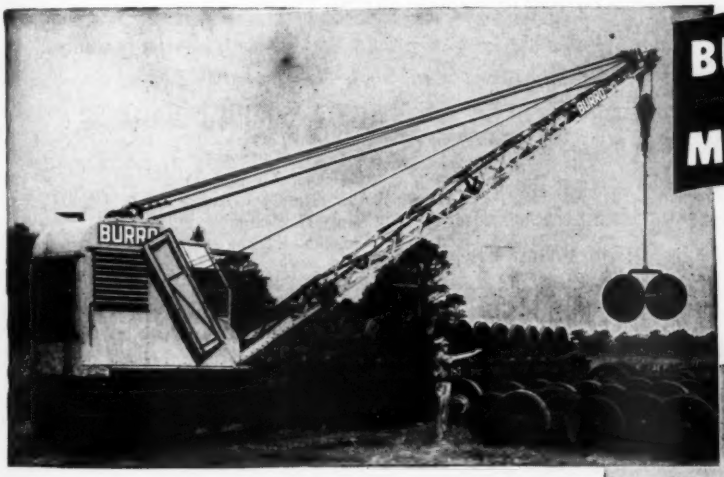

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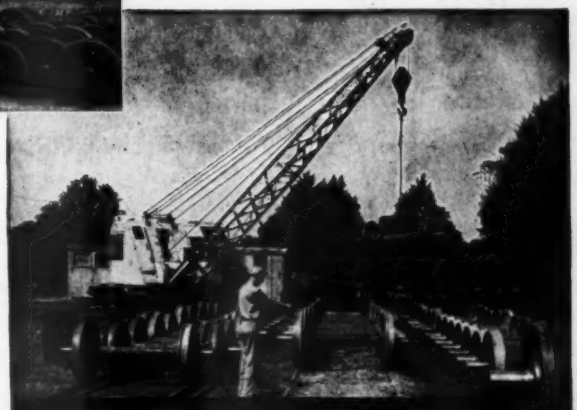
Unloading car wheels with a Burro. The Burro moved the flat car into position and will haul it away when wheels are unloaded.



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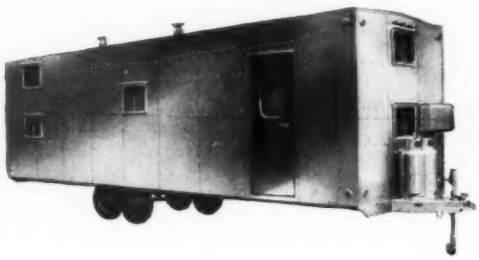

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What's the answer? (cont'd)

encountered. In this event, firm, even pressure on the borer will achieve the best results. Forcing the tool into such wood can result in shearing of the cutting edge and ultimate destruction of the tool.

Bore at contact points

When boring bridge timbers, borings should be made at all contact points where moisture collects, and particularly below pile cut-offs, and at the ground line of piling. These are the points where decay can be expected to show first.

With communication poles, the ground-line area is the primary point for boring. This is the area where conditions for decay are optimum and where hollow heart can be critical. In such areas, an increment borer, properly used, can detect decay long before it becomes critical. Once detected, decay can be controlled by application of special preservative compounds now available to the industry. These modern techniques make it all the more important to be able to detect internal decay before it reaches the critical stage. The increment borer makes such evaluation possible.

Gives detailed instructions

By L. C. COLLISTER
Manager Tie and Timber
Treating Department
Santa Fe System
Topeka, Kansas

It is recognized that the potentially weak points in a timber structure are close to and around the bored holes or other places where the wood has been necessarily framed after treatment. An indication of decay can be found by sounding but an accurate determination can be made by using an increment borer.

First of all the borer must be sharp. To start the borer, it is best to hold it near the point, steadying it with the left hand and exerting a steady pressure by the heel of the right hand and simultaneously turning it clockwise. After the borer is started, it can be easily turned into the wood by equal pressure from each hand at the ends of the handle, continually turning until the desired depth is reached.

The extractor is then eased in alongside of the core until it is all the way

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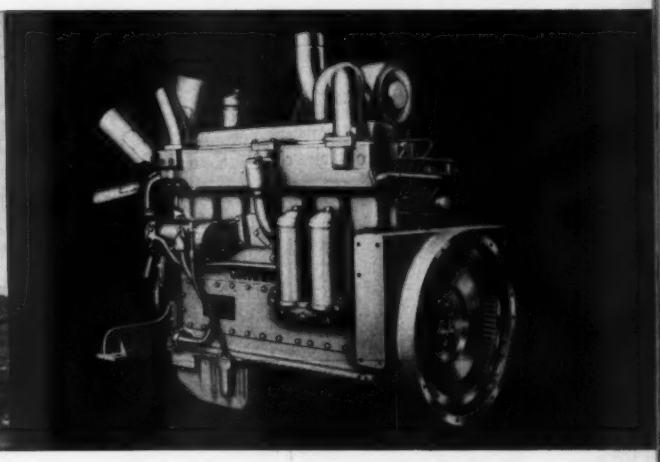
Compact engine plus many other refinements assure top performance, easier servicing, long life



Important changes make up the new Series C No. 14 Motor Grader—big improvements throughout to give you better performance, long life and servicing ease:

NEW COMPACT 150 HP ENGINE The short, rigid block and stress-relieved crankshaft give greater strength and shock resistance. New cylinder head design resists distortion yet has superior cooling characteristics. Large water pump with cast-iron impeller, ceramic seal face, and carbon type seal combined with a 20 per cent increase in radiator capacity improves cooling, lengthens life.

NEW STARTING ENGINE All-weather starting with this new two-cylinder vertical gasoline engine is assured. Replacing the horizontal engine, this design features aluminum pistons and overhead valves for improved performance. Bore is 2.38″, stroke is 2.38″, and compression ratio is 8:1. Over-running clutch in starter pinion prevents damage to starter engine when diesel starts, a year-round starting plus.

NEW SERVICING EASE An advanced fuel system is designed for easier servicing and more efficient operation. Compact fuel injection pumps with barrel and plunger assemblies enclosed in housing help reduce wear, lengthen service life.

Plus all the features that made the No. 14B the most versatile motor grader in the "big machine" field . . .

EXCLUSIVE OIL CLUTCH —provides up to 2000 hours of service without adjustment, equal to about a year of "adjustment-free" operation.

DRY-TYPE AIR CLEANER —removes 99.8 per cent of all dirt from intake air. Can be serviced in five minutes.

MECHANICAL CONTROLS —provide easy engagement. "Anti-creep" lock makes blade stay put under load.

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THE NEW NO. 14C MOTOR GRADER— MADE FOR THE BIG JOBS

in, being careful not to jam the core. The borer is then backed out one half to one turn. This breaks the core and makes for easier removal. The extractor is then removed, pulling the core with it. If the wood is sound it will be evidenced from the core. The amount of treatment can readily be measured and the amount of solid wood can be determined.

If a hollow spot or decayed area is encountered, the auger will turn without penetrating or else it will just give way immediately. The auger can then be pushed through this hollow until sound wood is again encountered, if that is so desired. In this case the amount of wood can be determined by measuring the difference between the length of the borer when the hollow is first encountered and the length after the borer is pushed through and solid wood is again encountered.

There are times when the core indicates that the wood is punky; however, this is quite often due to the fact that the wood is wet and if the core is allowed to dry, it will show that the timber is sound. Sometimes the core will come out in pieces indicating ring separation in the timber. It is advisable to carry a length of wire (coat hanger wire does very well for this) at least ½-in longer than the borer to aid in cleaning it, as occasionally the core gets jammed in the instrument and the extractor will not remove all of the wood.

It is also advisable to bore so that the hole will drain and not cause pockets of water to accumulate causing decay to set in. It is good practice to plug with sound treated plugs all auger holes.

One word of caution: It is possible to kill the patient by overexamining. In other words, the pile or stringer could be caused to fail by an excessive number of inspection holes in a given area in the timber.

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Tells where to bore

By T. H. Patrick
Chief Treatment Inspector
Chicago, Milwaukee, St. Paul & Pacific
Chicago

Points of decay or deterioration of timber will mainly be found near bolt holes, spiking areas, splits or large checks and, in case of untreated timber or timber treated with a waterborne preservative, at the contact points with wood or other material. In addition, in timber that is placed in the ground, such as poles or piling, the main point of decay is at the ground line. If it is in water the point of decay is just above the water line.

For determining the condition of the timber around bolt holes, cores shall be taken from the timber close to the bolt hole and at right angles to it and about 1/3 of the thickness of the timber from the lowest side. The core should be deep enough to go beyond the bolt. If there is further doubt, an additional core should be taken on the other side of the bolt and about the middle of the timber. The same applies to a spiking area.

Tests around checks shall be made by taking cores at right angles to the check and near the bottom of it and deep enough to go beyond the check. For timber contact areas, the core should be taken 1 in to 2 in from the contact point and parallel to it, and

GREATEST ADVANCES YET IN WEED AND BRUSH CONTROL!

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For complete information on revolutionary, new UROX and URAB weed killers, phone or write the nearest General Chemical office.

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What's the answer? (cont'd)

should be extended to a depth of 4 in to 5 in.

In testing poles, piling and posts, cores shall be taken toward the heart center and a few inches below the ground line or just above the water line. In case of bridge piling a core should be taken 3 in to 4 in below the cut off. All borings shall be 4-in to 5-in deep. On square timbers used for posts, the boring should be taken at right angles to the anual rings so as to cross as many of them as possible.

For special cases such as damaged treated timbers, good judgment is important, but a good rule to follow is to get a cross boring rather than boring directly into the damage surfaces.

Fueling and servicing equipment

What is the best way to handle the fueling and servicing of track equipment? Should the foreman or operator be responsible for seeing that this work is done? Explain.

Is operator's responsibility

By J. W. ZETTELMIER
Roadmaster
Minneapolis & St. Louis
Ft. Dodge, Iowa

The fueling and servicing of track equipment should be the responsibility of the operator as he is in position to know his machine and to know which working part needs servicing and how frequently.

If the operator knows that he is responsible for serving and fueling his machine he will learn to make small repairs himself and he will be more likely to see that it is maintained in a manner to get the best service from it.

It should be the duty of the foreman to see that the operator has the correct lubricating oils and greases and has enough time to service the machine. In a crew using several machines it takes less time if each operator takes care of his own machine.

The machines should be fueled and serviced at the beginning or end of a day's work whichever is most convenient. There may be short periods of time during the day when machines are idle and the operators should take advantage of the opportunity to service them at these times.

Depends on size and use

By R. V. DANGREMOND
Roadmaster
Elgin, Joliet & Eastern
Gary, Ind.

A combination of three methods is used on our railroad for fueling and servicing equipment. The method used for any specific piece of equipment depends upon its size and manner of use. Small track equipment, for example, such as power track wrenches, rail saws, bolt tighteners, rail drills, spike drivers, etc., when used as single work units with a track gang are serviced and fueled under the direct supervision of the foreman in charge of the gang. In these cases the machines are not usually operated by regular machine operators, but by laborers working compositely as operators, and hence the foreman is charged with the responsibility of seeing that the fueling and servicing is done.

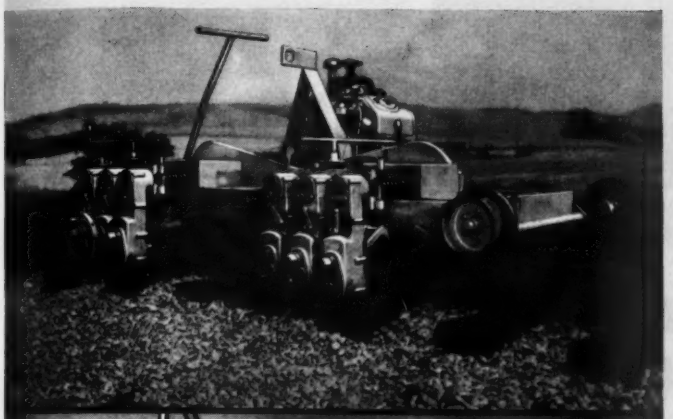
In the case of larger machines operated as single units, such as mobile cranes, dozers, tractors, yard cleaners, weed burners, compressors, etc., which are generally manned by regular operators, we fuel and service them as a routine operation with a service truck and a garage service man who does this work at the job site. Light greasing work is done in this case by the operator as needed.

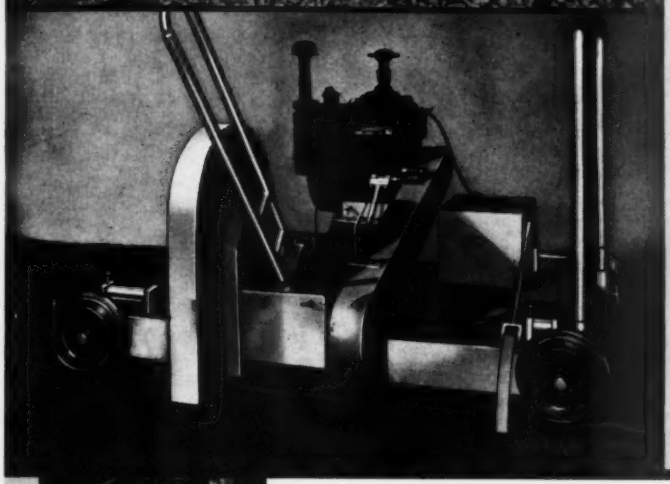
When track equipment is worked together as a part of a programmed operation, such as in rail laying, tie-renewal and surfacing gangs, it is serviced and fueled by the operators under the supervision of the gang foreman. Fuel is supplied from a tank mounted on a push car and carried with the gang. The fuel tank is filled by a bulk truck dispatcher by a local distributor.

The fueling and servicing of pool trucks and busses is done at the divisional equipment garage by a garage service man either before or after the regular work period of the drivers.

(Continued on page 80)

NOW IN-TRACK RAIL CROPPING AND MULTIPLE DRILLING





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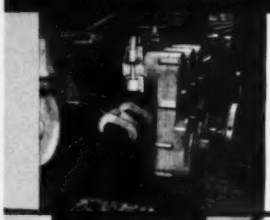
Now you can restore worn rail joints in-track to better than new with substantial savings in time, effort and expense. Working in tandem, the NCG 6-hole Rail Drill straddles a worn-out rail joint and simultaneously bores six accurately spaced bolt holes. Gone is the laborious drilling of each bolt hole. Then the NCG Hi-speed Rail Cutter crops out the worn joint section. In 60 seconds or less, it cuts a perfectly square, smooth rail end. The rails are pulled together, spliced, and the job is done.

Modernize your track maintenance procedures now with the new NCG 6-hole Rail Drill and Hi-speed Rail Cutter. Write today for complete information . . . your inquiry will receive prompt attention.



NCG 6-hole Rail Drill

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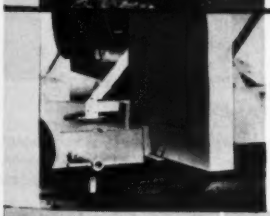

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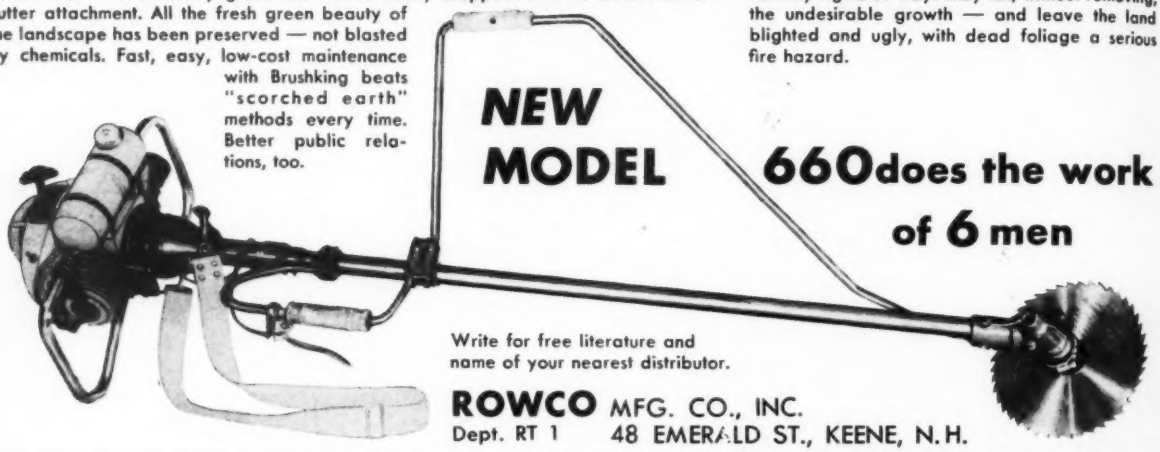

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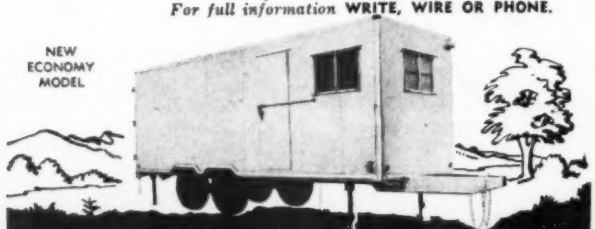

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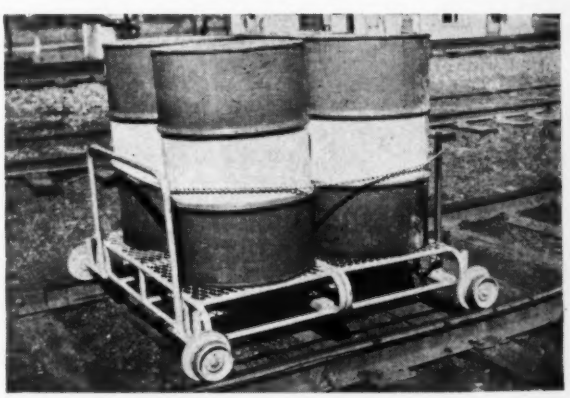

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Safely handles loads to 2000 lbs. All tubular high-carbon steel construction for trouble-free service. Car breaks conveniently in the center into two sections for easy handling and transportation. Each section can be used as a truck seat.

The deck is heavy mesh-expanded steel. Removable handle can be used at either end. Ball bearing cast steel wheels.

Platform Size 48"x45", Height Above Rail 8", Weight 140 lbs. complete

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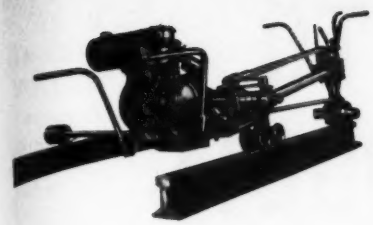

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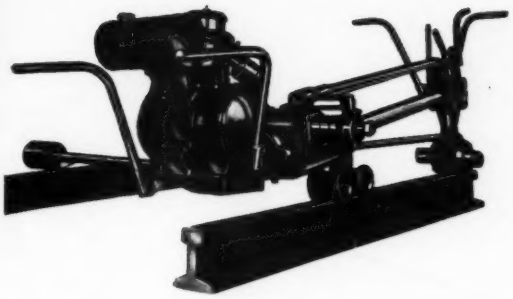

accuracy
power
lightweight
speed
interchangeability
of parts
rugged
dependability
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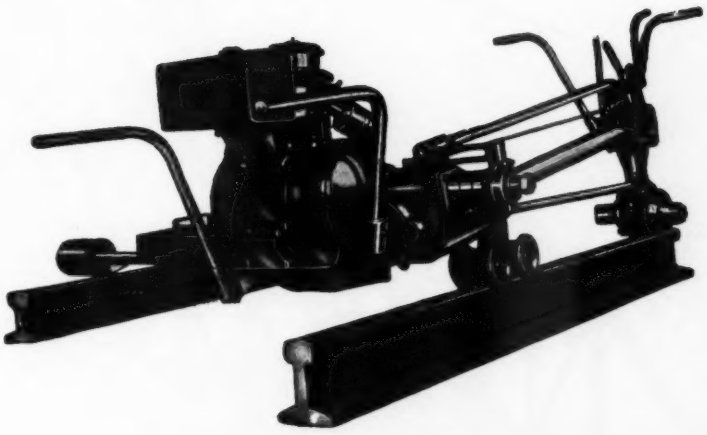
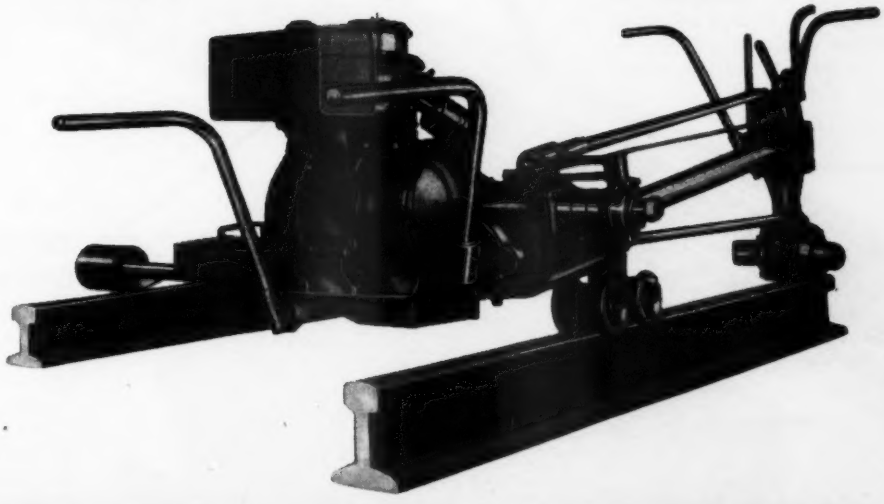


Down
Thru
The
Years



RAILROAD ACCESSORIES CORPORATION

MAIN OFFICE: 405 LEXINGTON AVENUE, NEW YORK 17, N.Y.

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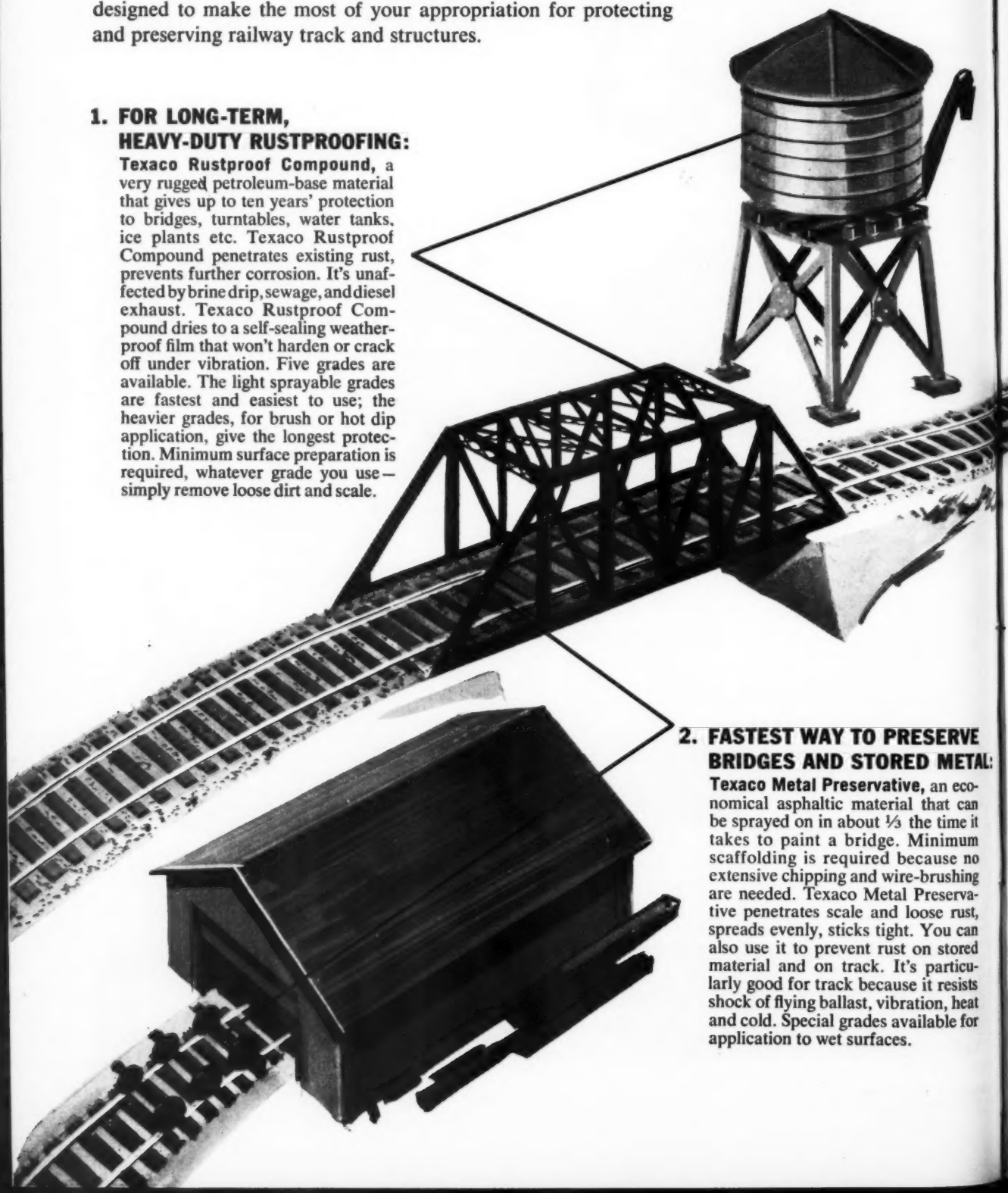
A short catalog of Texaco maintenance-of-way products that are designed to make the most of your appropriation for protecting and preserving railway track and structures.



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Texaco Rustproof Compound, a very rugged petroleum-base material that gives up to ten years' protection to bridges, turntables, water tanks, ice plants etc. Texaco Rustproof Compound penetrates existing rust, prevents further corrosion. It's unaffected by brine drip, sewage, and diesel exhaust. Texaco Rustproof Compound dries to a self-sealing weatherproof film that won't harden or crack off under vibration. Five grades are available. The light sprayable grades are fastest and easiest to use; the heavier grades, for brush or hot dip application, give the longest protection. Minimum surface preparation is required, whatever grade you use—simply remove loose dirt and scale.

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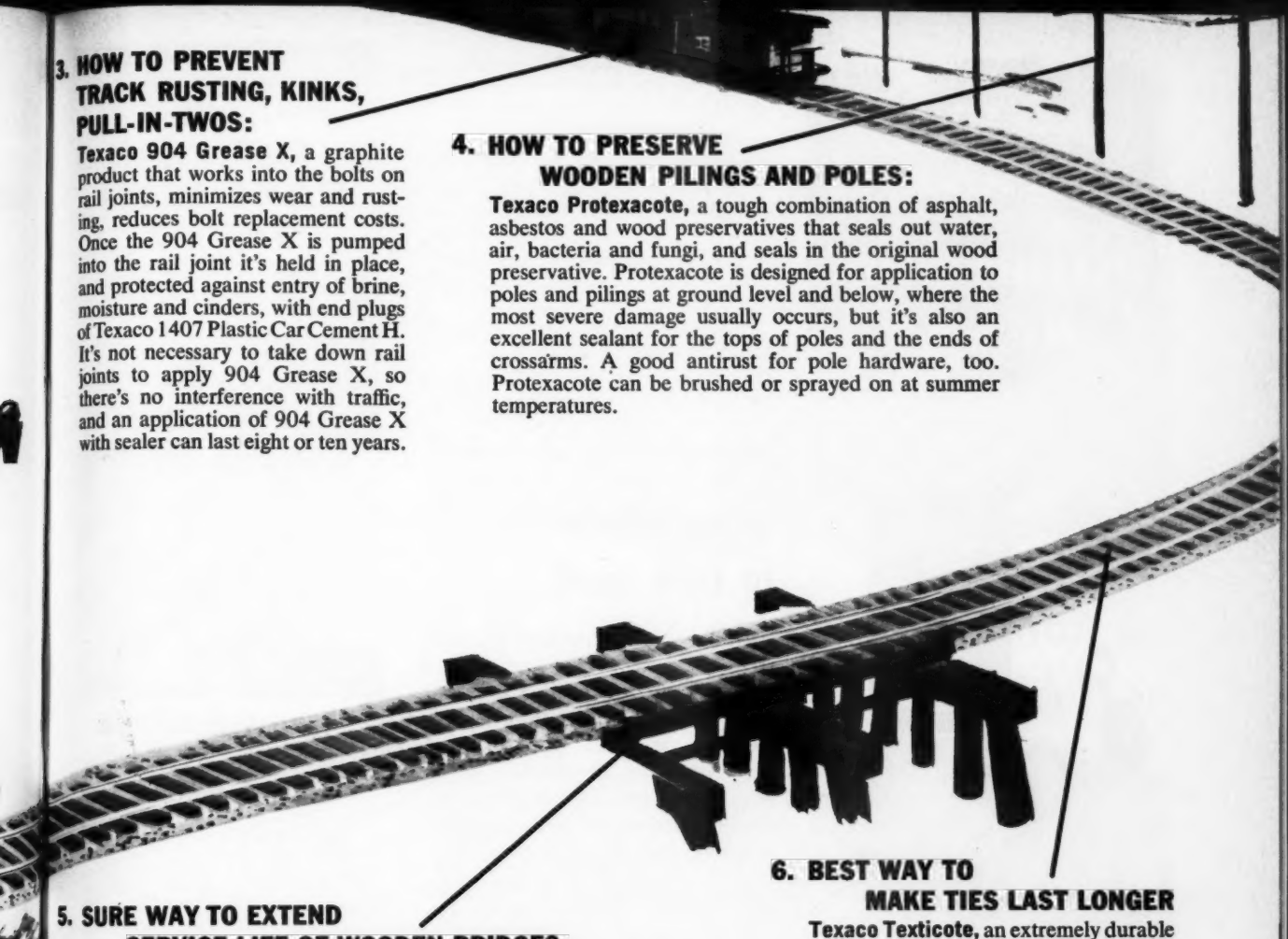
Texaco Metal Preservative, an economical asphaltic material that can be sprayed on in about ⅓ the time it takes to paint a bridge. Minimum scaffolding is required because no extensive chipping and wire-brushing are needed. Texaco Metal Preservative penetrates scale and loose rust, spreads evenly, sticks tight. You can also use it to prevent rust on stored material and on track. It's particularly good for track because it resists shock of flying ballast, vibration, heat and cold. Special grades available for application to wet surfaces.



3. HOW TO PREVENT TRACK RUSTING, KINKS, PULL-IN-TWOS:

Texaco 904 Grease X, a graphite product that works into the bolts on rail joints, minimizes wear and rusting, reduces bolt replacement costs. Once the 904 Grease X is pumped into the rail joint it's held in place, and protected against entry of brine, moisture and cinders, with end plugs of Texaco 1407 Plastic Car Cement H. It's not necessary to take down rail joints to apply 904 Grease X, so there's no interference with traffic, and an application of 904 Grease X with sealer can last eight or ten years.

4. HOW TO PRESERVE WOODEN PILINGS AND POLES:

Texaco Protexacote, a tough combination of asphalt, asbestos and wood preservatives that seals out water, air, bacteria and fungi, and seals in the original wood preservative. Protexacote is designed for application to poles and pilings at ground level and below, where the most severe damage usually occurs, but it's also an excellent sealant for the tops of poles and the ends of crossarms. A good antirust for pole hardware, too. Protexacote can be brushed or sprayed on at summer temperatures.

5. SURE WAY TO EXTEND SERVICE LIFE OF WOODEN BRIDGES:

Texaco Liquid Bridge Cement, a low-cost coating that can be applied with mops or brushes, or cut back for easy spraying. Makes ties, stringers and decking last longer because it waterproofs them, prevents the cracking and splitting that opens them up to frost damage. Tests and actual use-records show that an application of Texaco Liquid Bridge Cement can last more than eight years, and it costs only a few cents per tie.

6. BEST WAY TO MAKE TIES LAST LONGER

Texaco Texticote, an extremely durable coating that waterproofs wood ties at minimum cost, and prevents cracking and splitting. Texticote won't check, chip or become brittle, so it stays on despite vibration and shock especially when coated with gravel or crushed stone.

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HYDRAULIC
TESTING AND FILTERING EQUIPMENT

What's the answer? (cont'd)

(Continued from page 74)

In the case of individual gang trucks or busses the fueling is done in some cases through the use of a credit card, by an oil company or from a storage tank at gang headquarters. The servicing of this equipment is done periodically on a mileage basis.

I believe the "best way" to handle the fueling and servicing depends upon the type of equipment and the type of use it has in the work organization.

Using cranes in track work

What work applications can track supervisors make of cranes? Is there enough of this work to justify furnishing one to each supervisor, to each two or three supervisors, or to each division engineer? Should the crane be on-track, off-track, or a combination of both? Explain.

Uses crawler cranes

By S. FOGARTY, JR.
Division Engineer
Central of Georgia
Columbus, Ga.

Work applications of a crane are many and varied, but the main uses on our railroad are ditching, picking up bundles of old ties and handling rail and other heavy materials. We use ¾-yd cranes. Some are equipped with drag buckets, others with dipper sticks or shovels. We believe the ideal arrangement would be to have a crane equipped with drag bucket for every 600 or 700 miles of main line and a crane equipped with a dipper stick for every 1800 or 2000 miles of line.

On most railroads, it would be unnecessary to keep a full-time operator on the crane equipped with a dipper stick as short jobs could be handled by using an operator from one of the draglines, or the position could be bulletined for each large job encountered. Our crane operators have system seniority, so they can be used anywhere on the railroad. This is, we believe, the proper assignment, as it allows the doubling up of machines when neces-

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BUT IT COULD HAVE BEEN SAVED

...with OSMOSE
INSPECTION and TREATMENT

Whenever wood meets wood, or is in contact with ballast, ties, fastenings, stringers, etc. it offers an open invitation to fungus decay. Advanced infection at these critical areas can mean costly replacement of an entire bent which might contain 95% of perfectly sound wood.

Osmose Inspection and Treatment is the one sure, field-tested method to keep wood bridges and trestles in A-1 operating condition. Techniques perfected in treating over 5,000,000 power and communication poles in the past 20 years are applied by experienced crews who know wood from the inside-out. The Osmose Hollow-Heart Treatment, 24-12 Fire Retardant Treatment, Tri-way Ant and Termite Control Treatment are unique, low-cost proven methods to keep your timbers as good as new.

Actual case histories prove that OSMOSE in-place treatment runs between 2½ to 5% of the cost of replacement... pays for itself in the first 8 months of extended life. Why not let OSMOSE give you a quotation? No obligation to find out how you can enjoy these important savings, too. Write: Bridge Inspection and Treating Division, Osmose Wood Preserving Co. of America, Inc., 989 Ellicott St., Buffalo 9, N.Y.

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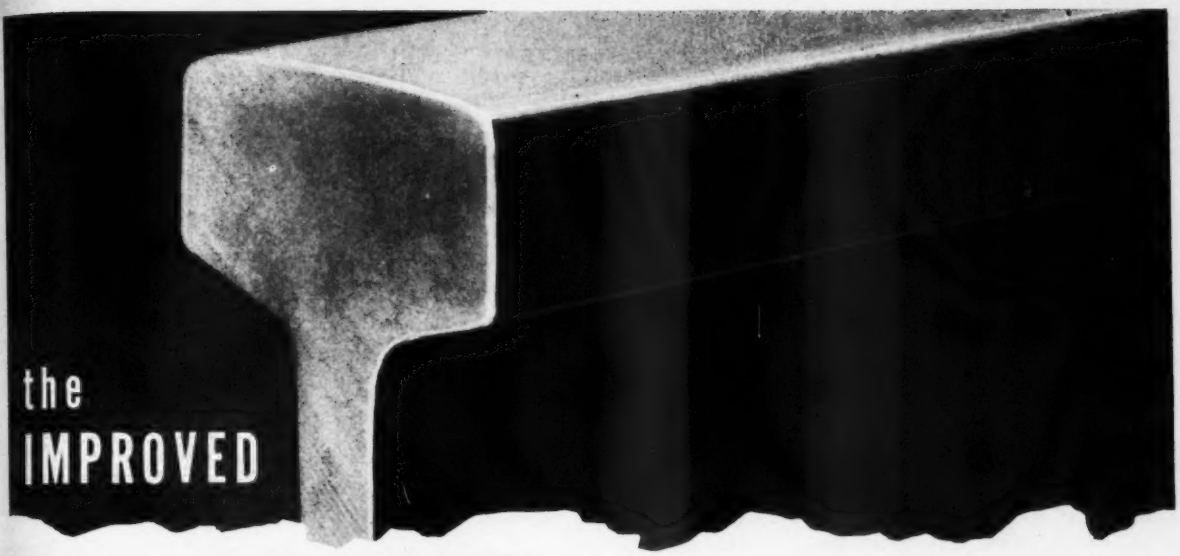

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What's the answer? (cont'd)

sary and also permits the transfer of the operators from one machine to the other.

These machines are also of great benefit to the B&B supervisors in handling material and in the replacement of pipe lines and culverts.

Our cranes are "off-track" equipment on regular treads. There has been a good deal of talk of purchasing rubber-tired cranes for movement on the highway, but until the manufacturers present a machine of enough capacity that will travel more than 40 mph on the highway, we believe our present rigs are the most satisfactory. The figure of 40 mph is used as several states are enacting minimum speed laws establishing this speed as the minimum for highway vehicles.

We have the crane flat cars equipped with guard rails on the edges of the cars, enabling us to use our cranes with a work train. They move up and down the flat to load or unload cars at each end.

Not enough work

By G. P. Chandler
Roadmaster
St. Louis-San Francisco
Fayetteville, Ark.

There are many jobs on which a track supervisor can use a crane. However, I do not feel that there is enough of this work to justify furnishing a crane to each track supervisor. Possibly each division engineer could use one.

However, one must first consider the proper size of crane to best fit the various types of jobs. The Speed Swing serves our purpose well for track work such as laying rail, relaying curves and laying new tracks. This machine is also versatile enough to be used for other types of right of way work.

If the division engineer should want to use a crane for bridge work, a larger type crane than the Speed Swing would be necessary. Also, the combination on-track, off-track machine would be preferred. But for track work only, the off-track crane would serve the purpose very well.

Concrete ties

(Continued from page 36)

ing over it occurs under the rail with the concrete on top of the tie being in compression and the bottom of the tie in tension. The indicated tension in the bottom is actually a release of the high compressive stress induced by the prestressing forces. From a preliminary examination of the test data, it appears that the maximum bending moment in the tie at the center of the rail for the test runs under regular service conditions did not exceed 120 in-lb, or about 80 per cent of the design bending moment.

Effect of pads on impact

The fastening assembly for the ties includes a plywood or plastic pad between the steel tie plate and the concrete tie to provide electrical insulation and some damping of the impact loads. To determine the damping effect of the tie pads two series of tests were made on the two types, each series consisting of a number of runs

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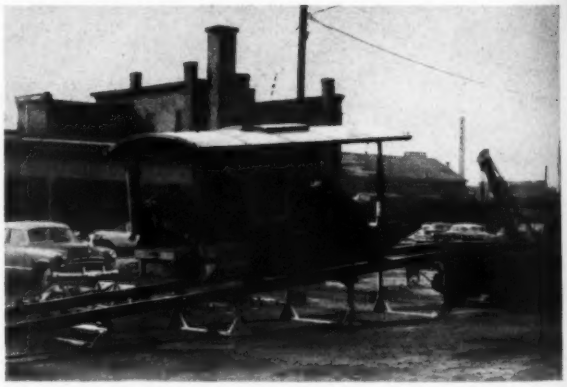
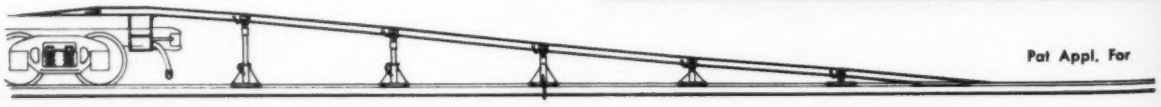
The Portable Unloader eliminates completely the need for building costly and time consuming rail and tie cribbing ramps. Two men can set up the Equipment Unloader, ready for use, in less than 30 minutes. Telescoping adjustable vertical supports allow exact fit for variable car heights.

Shown here is the Model M 1400-3





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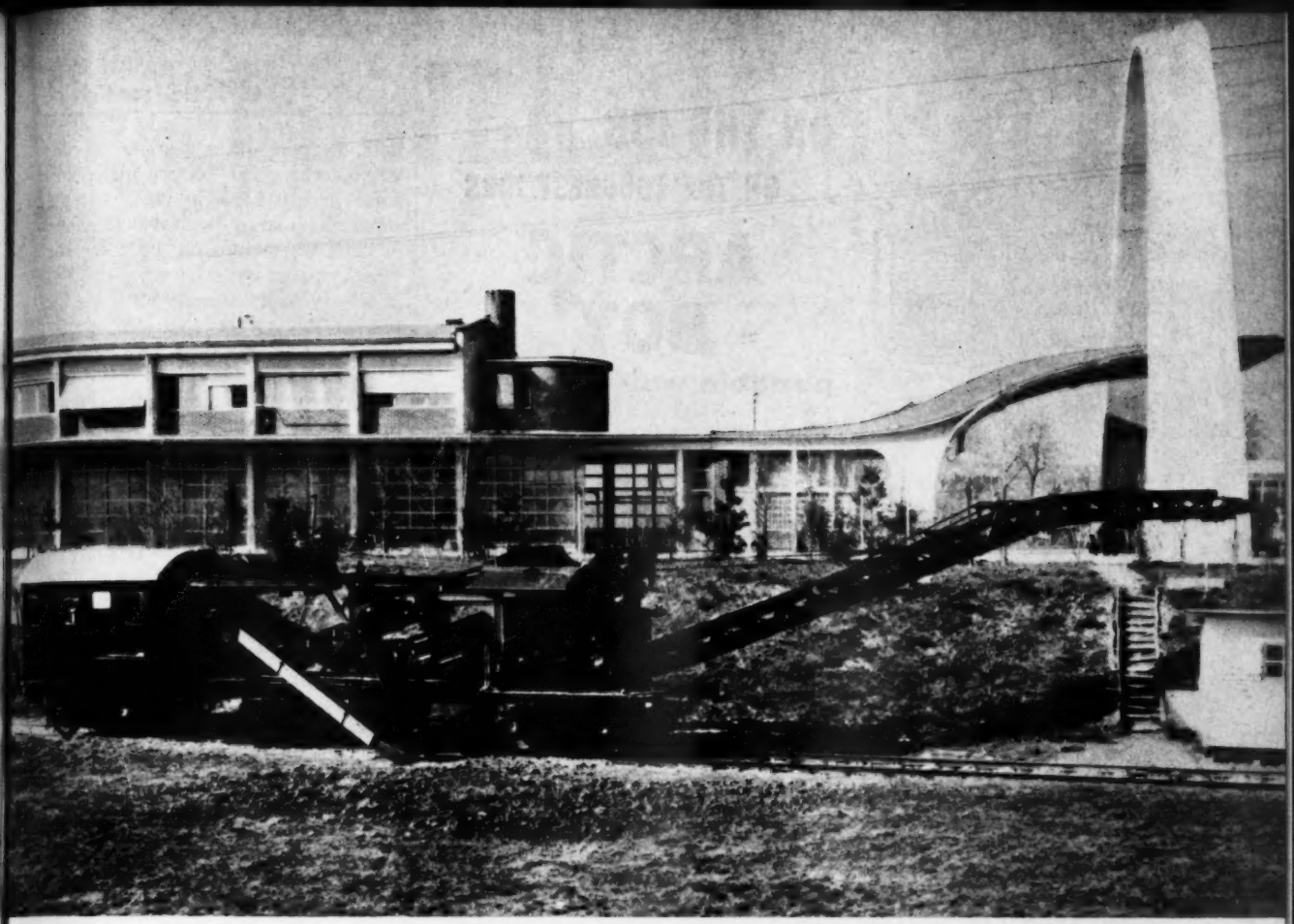

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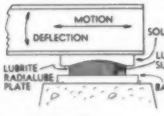

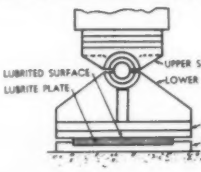

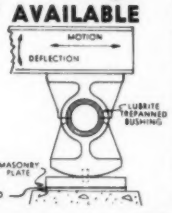

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Concrete ties cont'd

with the pad and a number of runs without the pad. To provide a uniform impact blow in these tests, a small metal strap ⅜ in wide by 0.05 in thick was placed on the rail. The wheel passing over the strap resulted in a very heavy impact blow on the tie, possibly greater than any impact that would be developed by a battered rail joint or flat wheel.

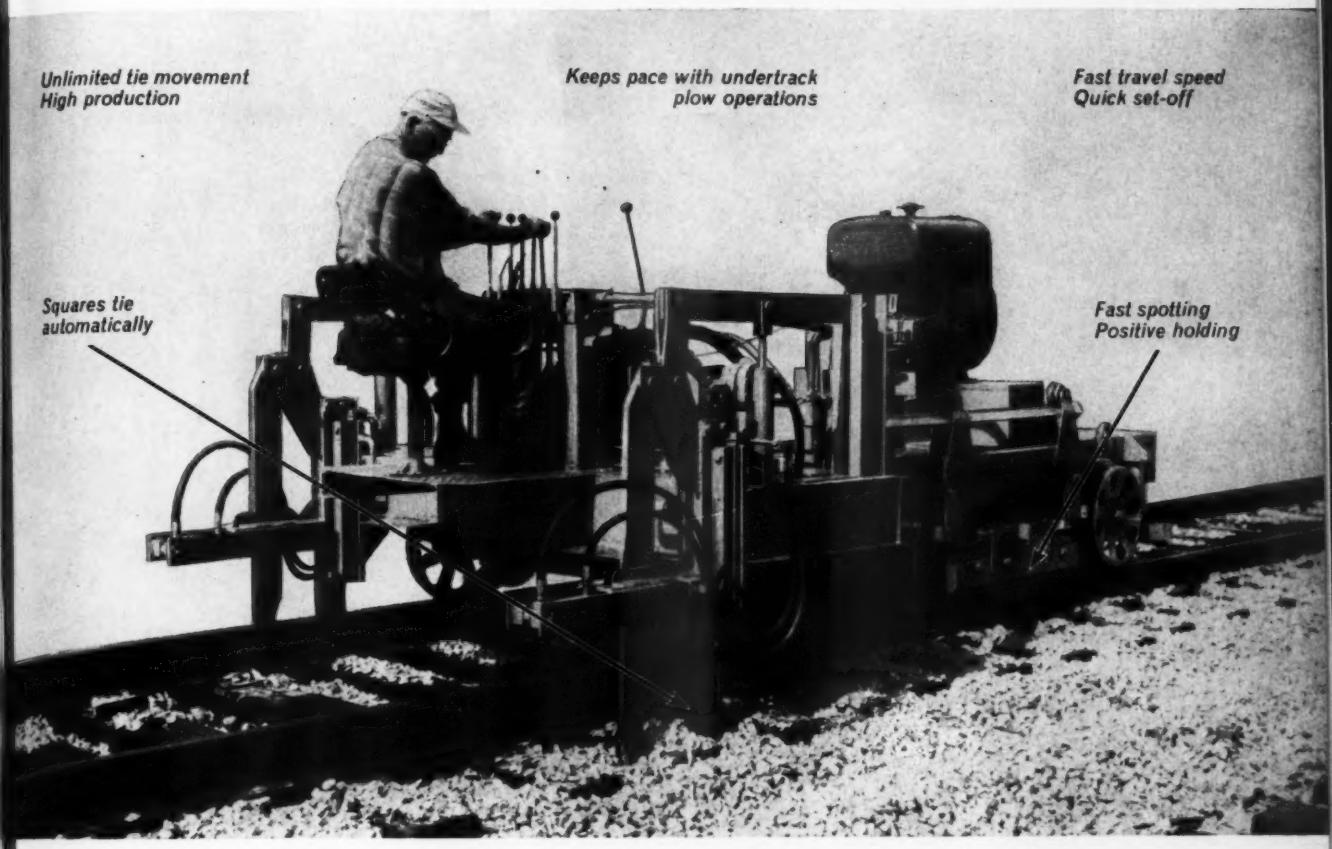
The general pattern of the impact blow on the oscillograms is characterized by a sharp increase in stress when the wheel hit the strap, followed by two or three stress vibrations decreasing rapidly in amplitude. The frequency of these vibrations is approximately 100 cycles per second and the indicated peak stress is at least 100 per cent higher than the flexural stress developed in the tie due to the weight of the wheel load alone.

In conducting these impact tests the strains were recorded under several trains operating at speeds varying from 20 mph to 25 mph with the tie pads in place. The pads were then replaced with steel shims and the impact tests repeated. The relatively low speeds of 20 to 25 mph were selected as previous experience has shown that maximum impact stresses in the rail from flat spots on car wheels occur at these low speeds. From the results of these tests there does not appear to be any appreciable reduction in the stresses with the two different types of pads from those secured with the steel shim. It can be seen that, with a bolt tension of 10,000 lb per bolt, a compressive stress is being developed in the pad of about 300 psi which apparently reduces its ability to absorb any impact stress.

The investigation was also planned to obtain the stresses in the spring clips and in the fastening bolts, with particular regard to the change in stress under passing trains. These stress measurements were made with different amounts of bolt tension from zero up to 10,000 lb. Here again only preliminary data can be given, but with zero bolt tension there was, as would be expected, little change in bolt tension or stress in the clip under passing trains. With 10,000 lb bolt tension there was about a 10 per cent release in bolt tension under passing trains, and also some release in stress in the spring clip.

(Continued on page 88)

P-S POWER TIE SPACER



DOES *ALL* TIE-POSITIONING JOBS *FASTER!*

HANDLES ANY TIE-POSITIONING JOB—changing number of ties per rail . . . straightening and spacing ties for renewal or tamping operations . . . whatever the job, P-S Power Tie Spacer ends costly hand labor, speeds work.

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DOES BETTER JOB—one arm of each set of tie tongs is guided against machine frame. Closing tongs automatically squares tie. Controlled power assures P-S Tie Spacer won't hump track. Track surface is never disturbed.

OFFERS PLUS FEATURES—simple, rugged, easy-to-maintain design of off-the-shelf components gives exceptional reliability and fast, far more economical upkeep. Travel speed, forward and reverse, is an honest 25 mph. Set-off uses hydraulic jacks—lateral set-off wheels carry machine off track. Track is cleared for traffic in moments. Machine is fully insulated for working and traveling. Check with Pullman-Standard to learn about our full line of track maintenance equipment.

For Detailed Information on P-S Track Maintenance Equipment, Contact

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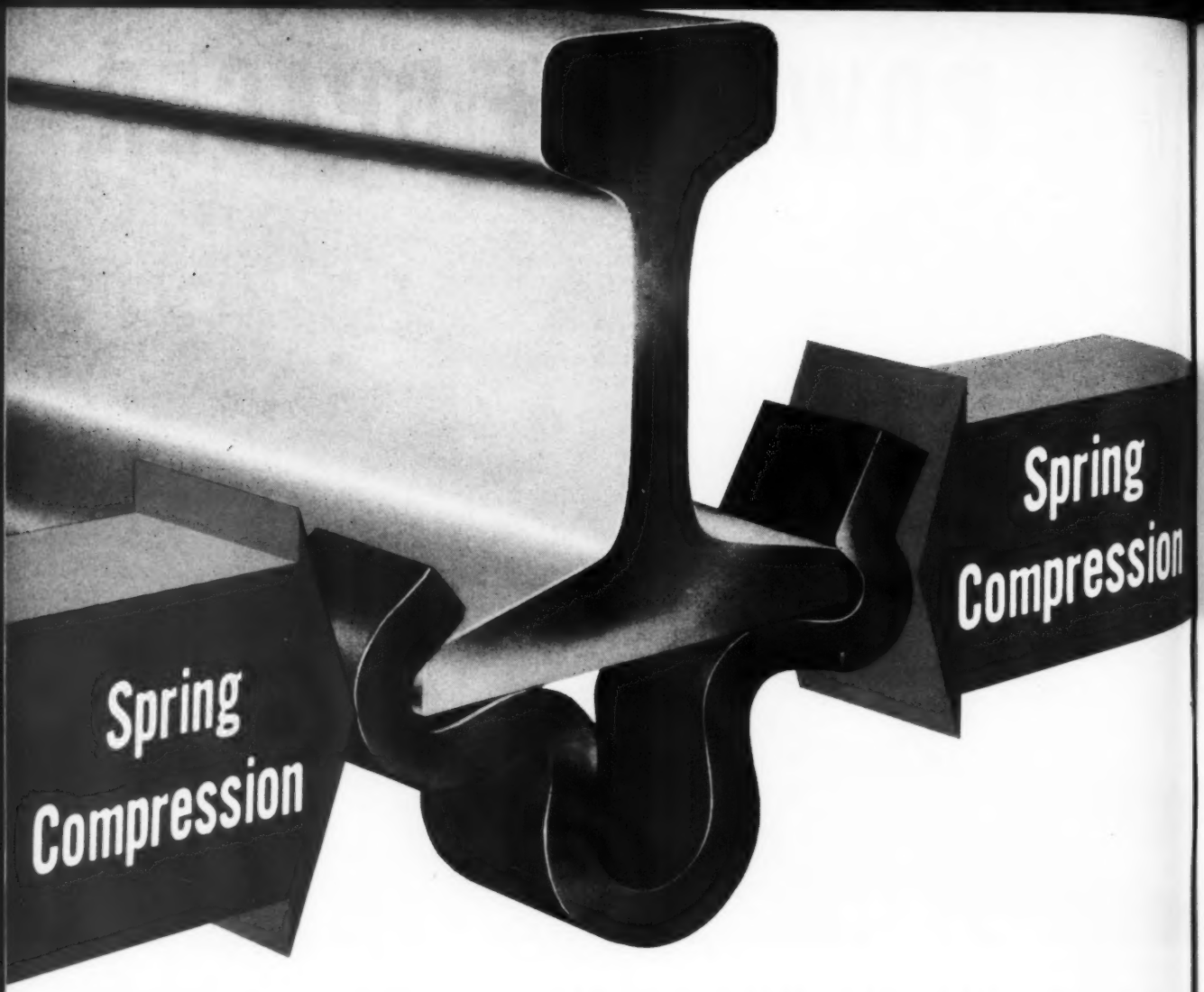

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The powerful grip of the Woodings Anchor comes from the spring compression illustrated at the left. It cannot be over-driven, whether applied by hand tool or by machine; and it is self-compensating for mill variations of rail dimensions. One-piece construction and careful heat treatment assure dependable uniformity. Design minimizes derailment damage.

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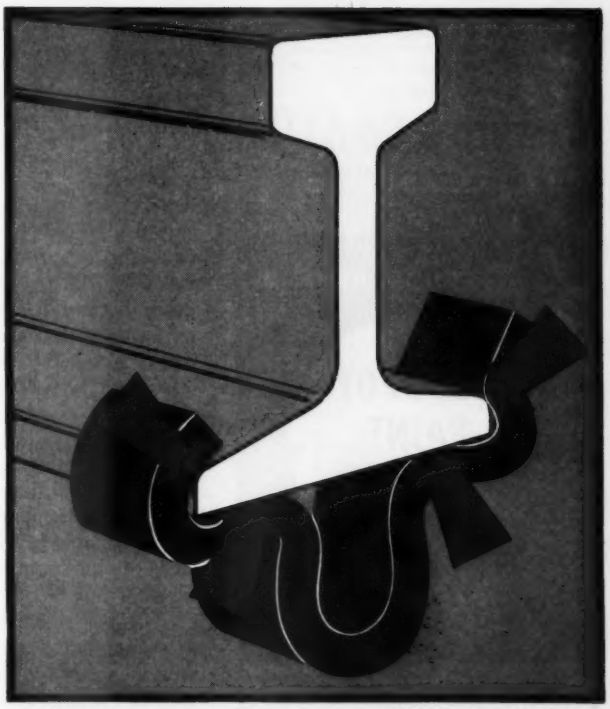

With its four-point symmetrical grip, the Woodings Rail Anchor is

BEST for welded rail
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THE NELSON COMPANY
Iron Mountain, Michigan (Box 349)
Montgomery, Alabama (Box 1892)

Concrete ties

(Continued from page 84)

Rather strangely the change in bolt tension and in spring-clip stress was a great deal more at an intermediate range of applied bolt tension of from 4,000 to 6,000 lb than with either zero or 10,000 lb. With this intermediate amount of bolt tension the applied bolt tension was usually completely released directly under passing wheels, and in most cases there was an added bolt tension of approximately 2,000 lb due to the uplift of the rail between wheels. Also, in the spring clip the stress was usually completely released directly under the wheels and augmented between wheels. These tests emphasize the importance of maintaining the clip bolts tight not only from the standpoint of providing adequate rail anchorage but also to prevent bolt and spring clip breakage.

Movement of ties and rail

Data were also secured during the field investigation on the vertical movement of both the tie and the rail, and it appears that movements of both were about the same. The first indication of any movement occurred when the first wheel of the locomotive was about 20 ft from the tie. At this position the rail and tie started moving upward and attained a maximum rise of about 0.02 in when the wheel was about 10 ft from the tie. The rail and tie then started moving downward and attained a maximum depression of about ⅛ in when the wheel was directly over the tie.

In order to convert the measured strains secured in the field on the surface of the concrete to equivalent bending stress or bending moment, one of the prestressed concrete ties was completely instrumented at the time the other six test ties were instrumented and this tie was shipped to the AAR Research Center. Here the tie was supported near the ends and loaded at the rail points with the Amsler hydraulic jack and the load determined that was required to develop the same strain in the concrete as was measured in the field. With this load-strain relationship it was then a simple matter to calculate the actual bending moment corresponding to the measured concrete strain.

It is interesting to note that during these laboratory tests the total strain in the concrete in the bottom of the t when the first crack developed w about 400 micro-inches as compare with a measured maximum strain o 300 micro-inches in the six test ti under the trains and under regula service conditions. It is anticipate that a full report giving a complet description of the two installations, design of the tie and fastenings, maintenance requirements and the results of the strain gage readings will be incorporated in the report of the AREA Tie Committee.

To the editor

Says magazine of 'great value'

Manila, Phil.

TO THE EDITOR:

I have found your magazine of great value in our work, particularly your issue of January 1960, containing the special report on the Baltimore & Ohio.

In view of the importance of the information in this special report on the B&O, I would like to have six copies of the issue for distribution to my division engineers. In fact, it is due to this report that I have requested my division engineers and assistant engineers to subscribe to your magazine.

Juan T. De Castro
Chief Engineer
Manila Railroad

(More on page 90)

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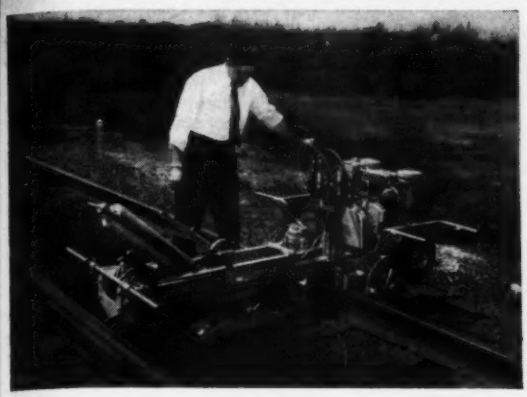

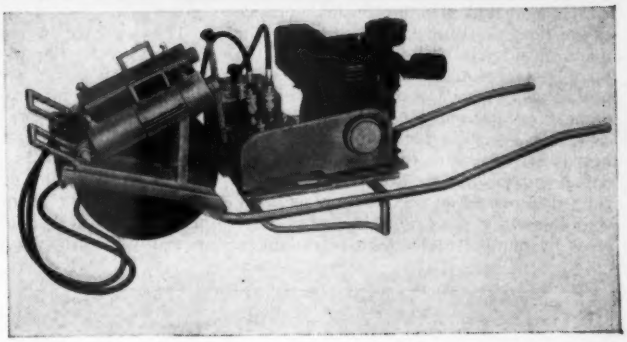

Upper right—A compact, air-cooled 8 hp gasoline engine powers the two hydraulic rams on the Model P-O Hydraulic Track Liner.

Upper left—The double flanged track rollers on the Model P-O-A adjust to any height and weight of rail. Set-off wheels optional.

Lower right—Mounted on this wheelbarrow-type frame, the Model P-O is easily transported or moved into position by one man.

Lower left—The control valve is mounted on the cylinder of the Model S-P Hydraulic Spot Liner for quick, efficient one-man operation.

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Model P-O Hydraulic Track Liner has a light, rigid and self-contained double flanged roller attachment that adjusts to any height and weight of rail. A compact, air-cooled 8 hp gasoline engine operates the two hydraulic rams that line thru switches and road crossings, powers the attachment for out-of-face linings. Available also mounted on a wheelbarrow-type frame for easy, one-man moving.

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To the editor (cont'd)

Says rail, tie condition is improving, not deteriorating

Chaffee, Mo.

TO THE EDITOR:

On the Opinion page of your July 1960 issue you have raised an important question.* Figures are not available to me, but speaking from past responsibilities and observations, made on the Frisco prior to my retirement, I can make the following statements.

The reduction in tie requirements for the five-year period ending 1960, as compared with the same period ending 1950, indicates an improvement in the general tie condition, rather than a deterioriation for that period. I am sure this is equally true of conditions on other railroads.

This is primarily the result of the introduction of mechanized gangs which required increased planning by maintenance officers, necessitating that tie renewals be made on a cycle basis. Prior to 1950, in many instances, ties were inserted by extra gangs, using hand labor, in a wholesale manner. A section gang would maintain its section by spotting with minimum tie renewals until the track was over-spotted and ties in general became bad. Then an extra gang was moved to the location and ties were inserted in great numbers and in some cases by number rather than according to requirements, leaving it up to the gang foreman to renew ties as he saw fit.

Mechanized gangs changed this. Ties are now inserted, after careful spotting of ties to be renewed, with a definite maximum per mile, and as each cycle is repeated tie conditions improve, bringing about lesser tie requirements. Our experience is where 800 ties per mile were required on the first run, this was reduced to an average of 350 ties per mile on the second run. This should be further reduced on the next turn of the cycle, until it reaches a certain leveling off point. The result is a more uniform tie condition then was obtained in past years.

The use of larger tie plates has had its effect on the reduction of tie requirements, especially the use of double-shoulder plates coupled with hold-down spikes. The result is to reduce the mechanical wear of ties, thereby giving added service life.

On many secondary lines replacement of untreated ties with treated ties has brought the tie requirements down and will continue to do so, until all untreated ties are a thing of the past.

Thus we have an improved tie condition, rather than deterioriation.

Reduction in rail requirements presents a similar story of improved methods of handling rail to secure more service life. Where new rail is being laid, more careful classification of the released rail is the order of the day to get maximum use out of the rail released, thereby reducing requirements for new rail. Rail suitable for cropping is moved to the cropping plant for conditioning and assignment to territory where many years of additional service is obtained by this method.

The use of the Speno grinding train has upgraded rail in track for several years of service life, thereby reducing requirements. The use of butt-welded rail is a forward step to longer life of rail, and incidentally such rail is also helpful in the preservation of ties, since the reduction of mechanical wear due to elimination of joints has brought a big saving in tie renewals.

Great progress is being made in the proper maintenance of bridges by going to permanent work wherever possible, filling in bridges and replacing them with other structures, such as concrete or multiple pipe, or replacing wood structures with concrete or steel where filling is not possible.

Thus, the writer feels that railroads are keeping abreast of deterioration and are making improvements in the condition of ties, rail and bridges.

I cannot state, however, that similar progress is being made in buildings or that the railroads are even properly maintaining their buildings. Many of them are in a bad state of repair. While some progress is being made in replacing buildings with sectional metal structures, the rate at which this is being done is very slow.

I fully understand the maintenance officer's problem when he gives first consideration to the track and bridges, and so it should be, but management must surely see that dilapidated, unsightly buildings are not good advertisements. To the layman they

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- **Unsurpassed Holding Power**
  No anchor has more holding power than the UNIT and few are its equal.
- **Most Economical**
  Low in first cost, UNIT gives you more for your money.
- **Greatest Reapplication Value**
  UNIT anchors can be reapplied repeatedly with minimum loss of holding power.
- **Most Effective on Secondhand Rail**
  Because of its spring-type design the UNIT anchor automatically compensates for base wear and corrosion.
- **Anchorage With Safety**
  With UNIT Rail Anchors there's less chance of damage to rail and/or the anchors in event of derailed wheels.
- **Best for Machine Application**
  The flat, wide section assures uniform application against ties, yet gives ample contact area for applicator shoe under all conditions.

are a source of doubt as to the physical condition of the railroad as a whole. More attention, therefore, should be given to well-maintained stations and office buildings and their surroundings. In this area we have not been keeping up with deterioration.

W. A. Schubert
Division Engineer (Ret)
Frisco Lines

** The editorial to which Mr. Schubert refers cited the large decreases that have occurred in tie and rail renewals in recent years, and raised the question whether present renewals are sufficient to restore the deterioriation that is taking place due to wear and the effects of decay, corrosion, weathering, etc.—Editor*

Association news

Northwest Maintenance of Way Club

The first meeting of the season will be held on September 22 at Coleman's Cafe, 2239 Ford Parkway, St. Paul. As in the past, the social hour will commence at 5:30 pm with dinner starting at 6:30.

The program will be featured by a motion picture entitled "The Eternal Harvest." Presented by William S. Story, assistant executive vice president of the Institute of Scrap Iron and Steel, Inc., the film will relate the story of the iron and steel scrap industry. It shows what scrap is, where it comes from and how it is processed in a scrap yard. In 1959 this film was chosen by the Freedoms Foundation at Valley Forge to receive the George Washington Honor Medal Award.

Mississippi Valley Maintenance of Way Club

The September meeting of the club, opening the 1960-61 season, will be held on the 12th at the Ambassador-Kingsway Hotel, 108 North Kingshighway, St. Louis, Mo. The program will be presented by E. W. Hobbs, superintendent of safety, Missouri Pacific, and will include a motion picture relating to safety in the maintenance-of-way department.

American Railway Engineering Association

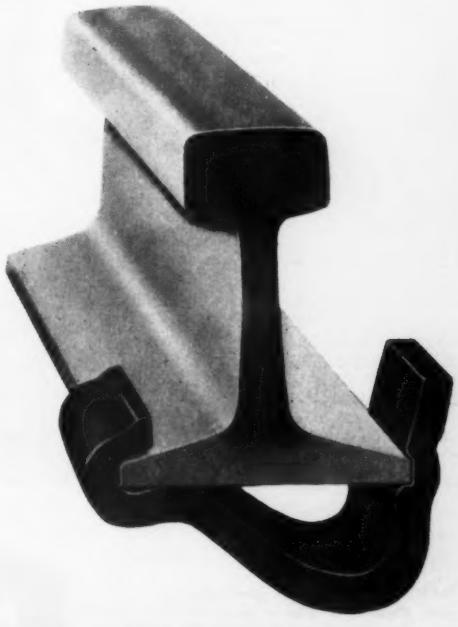
Several important actions were taken by the association's Board of Direction at a meeting in Chicago on August 8. Included was a decision to hold the general sessions of the 1961 convention (March 7-9) at McCormick Place, the new exposition center on Chicago's lakefront at 23rd Street. Other actions include the setting up of general plans for the 1961 convention; approval of committee-proposed research projects for 1961 and discontinuance of two of the association's standing committees following the 1961 convention. In addition, the board decided to establish closer relations between students and the association through the creation of Student Affiliates on college campuses.

The decision to hold the general sessions of the 1961 convention at McCormick Place, while continuing the convention hotel headquarters at the Conrad Hilton Hotel, as originally planned, contemplates also holding the annual association luncheon and most or all committee meetings at McCormick Place. This will bring all of these functions into closer proximity to the 1961 exhibit of the National Railway Appliances Association, to be held in the same building on March 6-9.

The two committees to be discontinued are Committee 17, Wood Preservation, and Committee 29, Waterproofing. Committee 17 will be combined with present Committee 3, Ties, with the new name, Ties and Wood Preservation, which committee will absorb the assignments of Committee 17, and those members of that committee who are not already members of Committee 3. Committee 29 is being discontinued under a plan which will see its assignments and most of its personnel absorbed by Committee 8, Masonry.

The plan to establish Student Affiliates does not constitute any form of membership in the association. It will be tried out at this time on a limited number of campuses. In the interest of railroading as a whole, it is planned to offer this status not only to students enrolled in engineering, but also to those enrolled in courses in any

The Unit Rail Anchor



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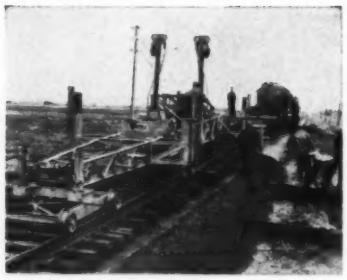
Plowing and removing worn ties is done at the head end of the MANNIX AUTO-TRACK. Worn ties are automatically ejected by conveyor.

Aligning unit at rear of MANNIX AUTO-TRACK keeps track in rough alignment behind plow, accurate alignment behind sled.



Sled replaces plow to place ballast under ties. This track was raised five inches.

MANNIX AUTO-TRACK eliminates 15 to 20 men, finishes a mile or more of track per day. For details or showing of operating films write, wire or phone TODAY. No obligation.

MANNIX INTERNATIONAL INC.

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Phone WAlnut 7-9411

Association news (cont'd)

of the physical and social sciences, such as transportation, industrial management, business administration and economics. Annual dues for students becoming thus affiliated with the AREA will be $2. Student Affiliates will receive the association's six technical bulletins and, through the association, the 12 regular issues of *Railway Track and Structures* magazine.

Supply trade news

W. B. Blix
Nordberg

John W. Storer
Osmose

NORDBERG MANUFACTURING CO.—**W. B. Blix,** manager of the Railway Equipment Division of **Nordberg Manufacturing Company,** Milwaukee, has been named vice president in charge of the division. **Henry H. Talboys,** associated with Nordberg for more than 35 years and for many years vice president in charge of the Railway Equipment Division, has been appointed consulting vice president of that division. In that capacity, Mr. Talboys will devote his principal attention to research and development.

Mr. Blix has had more than 25 years of experience in railway track maintenance and its mechanization. He joined Nordberg in 1947 as assistant manager of the Railway Equipment Division, having previously been associated with railroad maintenance of way departments for 13 years in various capacities. He began his railroad career immediately following his graduation from the University of Pennsylvania with a degree in civil engineering.

OSMOSE WOOD PRESERVING CO. — This company has created a Railroad Division, according to an announcement by **John H. Surdam,** president. Heading the new division as manager will be **John W. Storer,** who has been chief of the company's operations in the Midwest. Mr. Storer, who will continue to have headquarters at Madison, Wis., has served with this company for ten years.

YORK MODERN CORPORATION—**Eric G. Peterson,** Danbury, Conn., has been appointed railroad representative.

Obituary

S. M. Harrison, vice president of the Rail Joint Reforming Company, and district sales manager of the Rail Joint Company, Divisions of Poor & Co., located at Birmingham, Ala., died on July 29.

ROOTS AND LOADS TIES

LAYING WELDED RAIL

9' WIDE TRACK CLEANING BUCKET

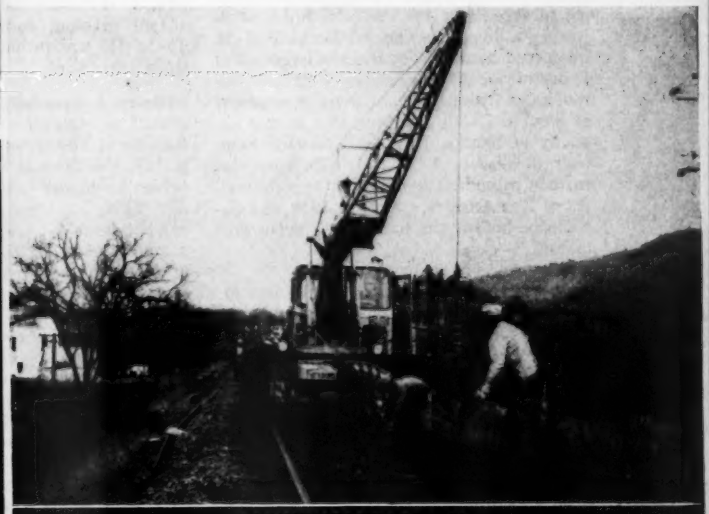
SPEED SWING

MODEL 441

Developed and Built
for Railroad Maintenance

180° BOOM SWING

DOES ALL JOBS!



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12 FAST CHANGE ATTACHMENTS

- Forks
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- Tote Hook
- 18' Boom Extension
- Fork Tie Baler
- Track Cleaning Bucket
- Back Hoe
- Clamshell
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RAILROAD DIVISION
141 W. JACKSON PMC CHICAGO 4, ILL.

80 Years of Service
to the Railroad Industry

Biographical briefs

(Continued from page 10)

James A. Caywood, 37, who was recently promoted to assistant chief engineer—maintenance of the Baltimore & Ohio at Baltimore, Md. (*RT&S*, Aug., p. 10), was born at Kona, Ky., and graduated from the University of Kentucky in 1944 with a Bachelor of Science degree in civil engineering. He entered railroad service with the Louisville & Nashville in 1946 as senior instrumentman, joining the B&O the following year as an assistant in the engineering corps. Mr. Caywood was promoted to assistant division engineer at Grafton, W.Va., in 1950 and division engineer at Cincinnati, Ohio, in 1953, serving also in that capacity at Baltimore. He was further promoted to engineer maintenance of way, Eastern Region, in 1957, the position he held at the time of his recent promotion to assistant chief engineer—maintenance.

Alan D. DeMoss, who was recently promoted to assistant engineer maintenance of way and structures, Pacific Lines, of the Southern Pacific at San Francisco, Calif. (*RT&S*, July, p. 10), was born at Sacramento, Calif., and graduated from Sacramento State College. He entered the service of the SP in 1943 as a rodman. Following military service in World War II, he served as assistant division engineer at Dunsmuir, Calif. Subsequently he was promoted to senior assistant division engineer at Stockton, Calif., serving also in that capacity at Sparks, Nev., and division engineer at Ogden, Utah. Mr. DeMoss was further promoted to assistant superintendent at Los Angeles, Calif., in 1958, the position he held at the time of his recent promotion.

George P. Wilson, Jr., 26, who was recently appointed assistant to chief engineer of the Piedmont & Northern at Charlotte, N. C. (*RT&S*, June, p. 10), was born at Spartanburg, S. C., and received his higher education at the University of South Carolina. He entered railroad service in 1956 with the Atlantic Coast Line as a junior engineer, Grade 2, at Florence, S. C., being promoted to junior engineer, Grade 1, at Savannah, Ga., in 1957. Mr. Wilson was serving in the latter capacity prior to joining the P&N as assistant to chief engineer.

Donald A. Shoff, 28, who was recently promoted to supervisor track on the Pennsylvania at Monongahela, Pa. (*RT&S*, May, p. 10), was born at Johnstown, Pa., and graduated from the University of Michigan in 1954 with a Bachelor's degree in civil engineering. He entered the service of the PRR in February 1954 as a junior engineer at Crestline, Ohio. In April of that year he entered the U. S. Army, serving with the Military Railway Service at Fort Eustis, Va., in various positions, including supervisor track and road foreman of engines. Two years later he returned to the PRR in his former position at Crestline. Mr. Shoff was promoted to assistant supervisor track at Enola, Pa., in July 1956. He was serving in that capacity at Washington, D. C., at the time of his recent promotion.

Harold F. Whitmore, 70, who recently retired as chief engineer of the Nickel Plate at Cleveland, Ohio (*RT&S*, July, p. 10), is a native of Little Valley, N.Y. and graduated from Ohio Northern University with a degree in civil engineering. He also attended Edinburgh University. Mr. Whitmore entered the service of the Nickel Plate in 1916 as a rodman at Cleveland. From September 1917 to September 1919 he was in the U. S. Army, serving overseas with an engineering construction battalion. Returning to the Nickel Plate, he was appointed rodman at Conneaut, Ohio, subsequently serving as instrumentman, draftsman and assistant division engineer. Mr. Whitmore was advanced to division engineer at Frankfort, Ind., in 1939 and assistant to chief engineer at Cleveland in 1945. He was promoted to chief engineer three years later.

Harry J. Weccheider, 65, who recently retired as engineer maintenance of way on the Erie at Youngstown, Ohio (*RT&S*, July, p. 10), was born at Buffalo, N. Y., and received his higher education at night school, also taking a correspondence course in civil engineering. He commenced his railroad career with the Erie in 1916 as a timekeeper in an extra gang at Buffalo, N. Y., being promoted to assistant extra gang foreman in January 1917 and section foreman six months later. From March 1918 to June 1919 he was with the U. S. Army, serving overseas where he was wounded in action. Mr. Weccheider returned to his former position in July of the latter year, being promoted to general yard foreman at Susquehanna, Pa., in 1922. He was further promoted to track supervisor there in 1923, later being transferred to Buffalo, N. Y., to general roadmaster at Youngstown in March 1928 and to division engineer at Meadville, Pa., nine months later, also serving in that capacity at Huntington, Ind., Hornell, N. Y., and Jersey City, N. J. Mr. Weccheider was advanced to engineer maintenance of way at Youngstown in 1946.

Earl A. Roth, 62, who was recently promoted to chief engineer of the Illinois Terminal at St. Louis, Mo. (*RT&S*, June, p. 10), was born at Boonville, Ind., and received his higher education at Purdue University. Mr. Roth entered railroad service in 1920 with the Indiana Railway & Light Co. as assistant engineer. In 1924 he joined the Illinois Traction Company, now the Illinois Terminal, in the same capacity. Mr. Roth was appointed assistant chief engineer of the Illinois Terminal in 1946, the position he held at the time of his recent promotion.

Horace E. Richardson, 32, who was recently promoted to division engineer on the Seaboard Air Line at Jacksonville, Fla. (*RT&S*, April, p. 10), was born at Wendell, N. C., and graduated from North Carolina State College in 1950 with a Bachelor's degree in civil engineering. He entered the service of the SAL in 1950 as a student engineer at Raleigh, N. C. In December of that year he joined the U. S. Army, serving at the Transportation Research and Development Station, Ft. Eustis, Va. Mr. Richardson was promoted to assistant to division engineer at Raleigh in 1952 and assistant division engineer there two years later. He was further promoted to principal assistant division engineer at Savannah, Ga., in 1958. Mr. Richardson was serving in the latter capacity at Americus, Ga., at the time of his recent promotion.

Robert E. Vander Klipp, 39, who was recently promoted to assistant division engineer on the Chesapeake & Ohio at Saginaw, Mich. (*RT&S*, May, p. 10), was born at Grand Rapids, Mich., and received his higher education at Grand Rapids Junior College and Michigan College of Mining and Technology. Mr. Vander Klipp entered the service of the C&O in 1947 as a rodman at Grand Rapids. He was promoted to levelman there in 1948, instrumentman there in 1951 and assistant engineer at Saginaw eight months later. In 1954 he was assigned to the operating department as special representative, the position he held at the time of his recent promotion.

Donald F. Richardson, 33, who was recently promoted to supervisor track and structures on the Alabama, Tennessee & Northern, a subsidiary of the Frisco, at York, Ala. (*RT&S*, May, p. 10), was born at Chanute, Kan., and graduated from Oklahoma State University in 1951 with a Bachelor of Science degree in civil engineering. Mr. Richardson entered railroad service on the Frisco in 1951 as a junior engineer, grade B, at Tulsa, Okla., being promoted to junior engineer, grade A, at Amory, Miss., in 1953. He was further promoted to assistant engineer at Amory in 1956, the position he held at the time of his recent promotion.

A. E. Shaw, Jr., 30, who was recently promoted to supervisor track on the Pennsylvania at North Judson, Ind. (*RT&S*, May, p. 10), was born at Richmond, Va., and graduated from Iowa State University in 1954 with a Bachelor of Science degree. He entered the service of the PRR in 1954 as a junior engineer at Pittsburgh, Pa., being promoted to assistant supervisor at York, Pa., two years later. He was serving in that capacity at Trenton, N. J., at the time of his recent promotion.

A. D. DeMoss
SP

G. P. Wilson, Jr.
P&N

H. F. Whitmore
Nickel Plate

H. J. Weccheider
Erie

R. L. Mays, 56, who was recently promoted to chief engineer of the Nickel Plate at Cleveland, Ohio (*RT&S,* July, p. 10), was born at New Castle, Ky., and graduated from the University of Kentucky in 1925 with a Bachelor of Science degree in civil engineering, also receiving a civil engineering degree in 1931. He entered the service of the Nickel Plate in 1928 as a structural designer at Cleveland. Subsequently he was promoted to assistant engineer and assistant division engineer, both at Fort Wayne, Ind., assistant superintendent of bridges and buildings at Frankfort, Ind., and designing engineer at Cleveland. Mr. Mays was further promoted to division engineer at Frankfort in 1948 and assistant to chief engineer at Cleveland in 1953. He was advanced to assistant chief engineer in 1955, the position he held at the time of his recent promotion.

David J. White, 54, who was recently promoted to assistant chief engineer of the Nickel Plate at Cleveland, Ohio (*RT&S,* July, p. 10), was born at Ossian, Ind., and received his higher education at Purdue University and Fenn College. Mr. White entered the service of the Nickel Plate in 1927 as a rodman at Ft. Wayne, Ind., being promoted to instrumentman at Cleveland the following year. After serving in that capacity at Ft. Wayne he was promoted to draftsman at Cleveland in 1935. He was promoted to assistant division engineer at Frankfort, Ind., in 1940, special engineer at Cleveland in 1950 and division engineer at Frankfort in 1953, later being transferred to Ft. Wayne. He was serving in that capacity at Brewster, Ohio, at the time of his recent promotion to the position of assistant chief engineer.

R. L. Mays
Nickel Plate

David J. White
Nickel Plate

Clarence E. Jackman, 42 who was recently promoted to chief engineer—construction and maintenance of the Baltimore & Ohio at Baltimore, Md. (*RT&S,* Aug., p. 10), was born at Byers, Ohio, and graduated from Purdue University in 1940 with a Bachelor of Science degree in civil engineering. Mr. Jackman entered the service of the B&O in 1940 as an assistant in the engineering corps at Cincinnati, Ohio, being promoted to assistant engineer there in 1945. He was further promoted to assistant division engineer at Newark, Ohio, two years later, being transferred to Connelsville, Ohio, in 1948, division engineer at Newark in 1950, serving also in that capacity at Cincinnati and Baltimore, and engineer maintenance of way, Eastern Region, in 1954. Mr. Jackman was further promoted to assistant chief engineer three years later and assistant chief engineer—maintenance (system) in 1958. He was serving in the latter position at the time of his recent promotion.

Joseph L. Loida, 69, who recently retired as chief engineer of the Illinois Terminal at St. Louis, Mo. (*RT&S,* June, p. 10), was born at St. Louis and received his higher education through correspondence courses. Mr. Loida commenced his railroad career in 1911 with the East St. Louis, Columbia & Waterloo (now abandoned) as a chainman-rodman at Columbia, Ill. In February of the following year he joined the Wabash as a rodman at Edwardsville, Ill. Seven months later he entered the service of the Missouri Pacific as a rodman-instrumentman at Poplar Bluff, Mo., later being promoted to instrumentman at Sedalia, Mo. In 1914 he joined the Frisco as a draftsman and photographer at St. Louis. Four years later Mr. Loida entered the service of the Union Railway as assistant engineer at Memphis, Tenn., returning to the MP later that year as a draftsman at St. Louis. Mr. Loida joined the St. Louis, Troy & Eastern (now the Illinois Terminal) as an assistant engineer at St. Louis, later serving as resident engineer and chief engineer. He was appointed staff engineer of the IT at St. Louis in 1928, being promoted to valuation engineer in 1941 and assistant chief engineer two years later. Mr. Loida was further promoted to chief engineer in 1945.

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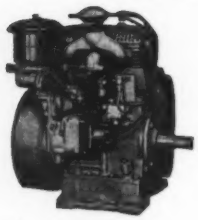

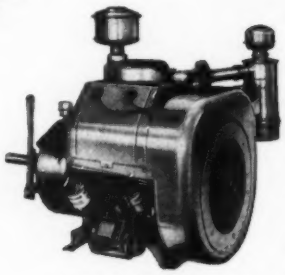

Model VR4D 56 hp. V-type 4-cylinder air-cooled engine.

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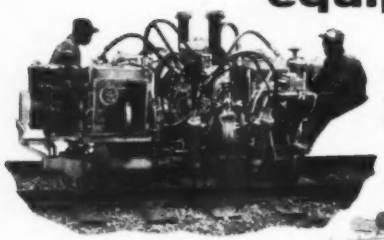
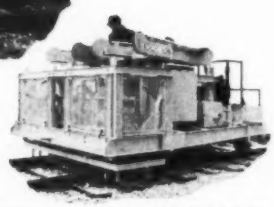


Racine Hydra-Quad Tampers, in tandem, made by Racine Hydraulics & Mchy., Inc., Racine, Wis. Powered by Model THD 2-cyl. Wisconsin Engine.



Nordberg one-man Gang Tamper, made by Nordberg Mfg. Co., Milwaukee, Wis. Powered by Model VR4D 56 hp. Wisconsin Engine.

High speed quality tamping calls for heavy-duty unfailing power in abundance. Each of the Wisconsin Heavy-Duty Air Cooled Engines powering these tampers, works Full Time . . . day after day, month after month, with minimum servicing.

While heavy-duty features are responsible for this kind of *workability*, there's a more basic reason for the success of Wisconsin Engines. Long ago, Wisconsin Motor Corporation decided to build only air-cooled engines. No other products were developed that might draw attention from this one single goal. The plan was sound, for from these undiverted skills and know-how has come a line of engines, unmatched in features, unmatched in *full time power delivery* in the 3 to 56 hp. range. *As a result, Wisconsin Engine Power is the number 1 choice in Maintenance-of-way Equipment!*

Write for general engine bulletin S-249 covering full line. Specific data available on all individual models. Address: Dept. R-20.

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Helps from Manufacturers

The following compilation of literature—including pamphlets and data sheets—is offered free to railroad men by manufacturers to the railroad industry. To receive the desired information, write direct to the manufacturer.

JACKS AND PULLERS. A new catalog is available which describes and illustrates the Simplex line of mechanical jacks and pullers. Designated Mechanical Catalog No. 60, it points out the features of the units and describes the types and uses of industrial jacks and pullers, including ratchet lowering, trip, journal, bridge, screw and push-and-pull jacks. Also described are special purpose equipment and accessories. Specifications and ordering details are included. Hydraulic Catalog No. 59 is also available which describes the Simplex line of hydraulic jacks and pullers. (Write: *Templeton, Kenly & Co., Dept. RTS, Gardner Road, Broadview, Ill.*)

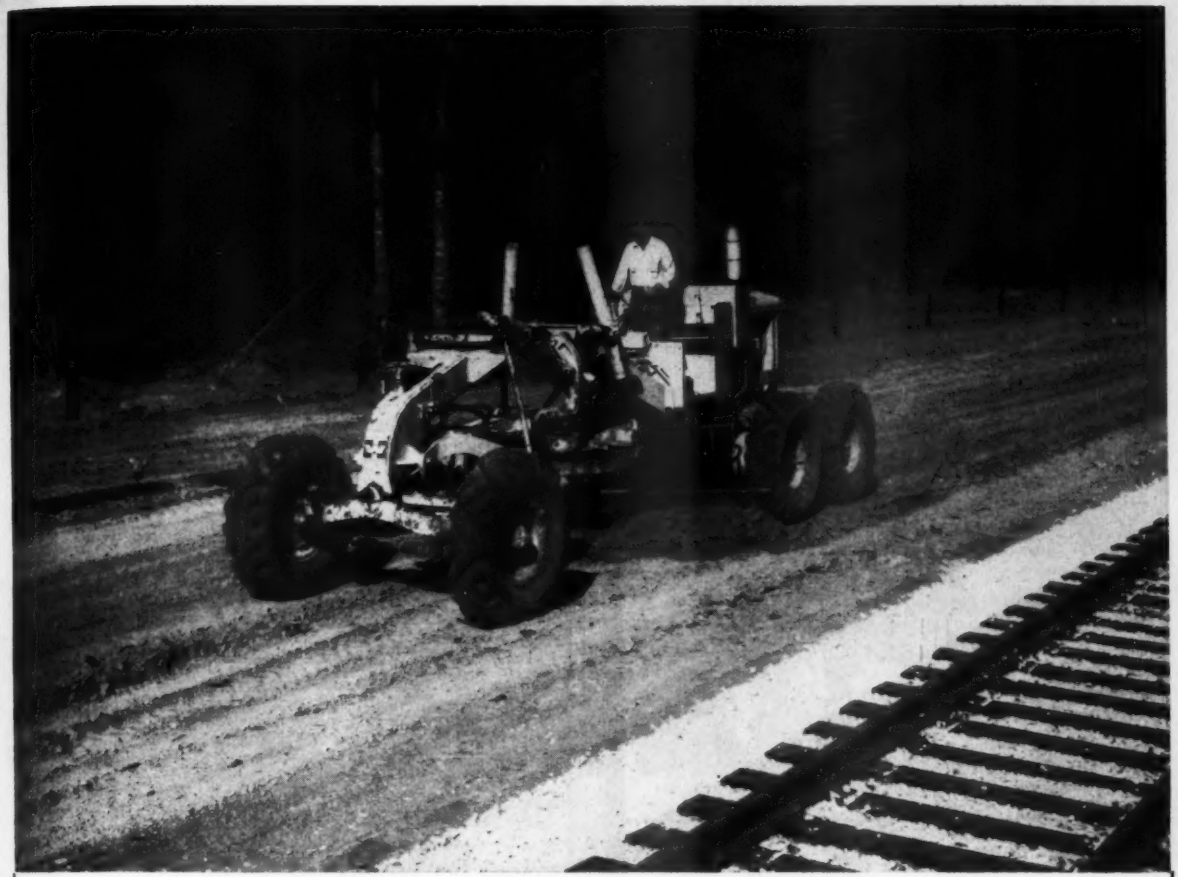
RUBBER PRODUCTS. The use of rubber tie, abrasion and crossing pads in street crossings, railroad crossings and on curves is described and illustrated in three circulars now available. The circulars give the results of service tests of the pads and point out their features and advantages. Photographs show the installations in which the rubber products were used and drawings illustrate the component parts of the installations. A fourth circular is also available which describes and illustrates single-shoulder rubber abrasion pads. The circular points out the features of the pads and tells how they can be used to provide a second shoulder for single-shoulder steel tie plates. Another circular describes and illustrates how rails can be laid on steel or concrete, without crossties, with the use of Hi-Insulating rubber rail seats. An installation is described with pictures showing the sequence of operations. (Write: *Railroad Rubber Products, Inc., Dept. RTS, 4538 Main Ave., Ashtabula, Ohio*)

EARTHMOVING EQUIPMENT. A 2-color, 8-page booklet is available which describes and illustrates the new Caterpillar 977H Traxcavator. The booklet points out that the bucket capacity of the new unit has been increased from 2¼ to 2½ cu yd and that the all-job average work potential of the 977H is 25 per cent greater than the former model. The operating and mechanical features are described, including a new 150-hp turbocharged engine, power-shift transmission coupled with a speed range selector, dry-type air cleaner and hydraulic system which is claimed to produce 27 per cent greater pry-out force than earlier models. Specifications are listed. (Write: *Caterpillar Tractor Company, Dept. RTS, Peoria, Ill.*)

TURRET DERRICK. A brochure is available which describes and illustrates the new Truco Model 8-TTD-30-U Universal Turret Derrick. The brochure points out that the derrick may be mounted at any of three positions on a truck, behind the cab, right rear or left rear. Other features described include unitized construction, full 360-deg rotation, 8,000-lb capacity, telescoping boom and low mounting height. On-the-job photographs show the unit equipped with the hydraulic digger, winch and single-man fiberglass basket. General specifications and a capacity chart are included. (Write: *Truco/Denver, Dept. RTS, 3963 Walnut St., Denver 5, Colo.*)

WALL COATING. The advantages of using Tile-It, a new tile-like permanent finish for walls and floors, are described in a new folder. The folder points out the features of the two-component, non-volatile epoxy coating and answers a number of questions regarding the new product. The manufacturer states that Tile-It can be applied by brush or spray to painted or uncoated surfaces of concrete, cement or cinder blocks, plaster, wall board, wood or metal. (Write: *McDougall-Butler Company, Inc., Dept. A-RTS, Buffalo, N. Y.*)

TRACTORS AND EQUIPMENT. The Case line of industrial tractors and equipment is described and illustrated in a new folder. Included in the folder are the different models of tractor-shovels, power-angling dozers, power-tilting bulldozers, wheel loaders and fork-lift units. The company's line of optional equipment is also described and illustrated. (Write: *J. I. Case Company, Dept. RTS, Racine, Wis.*)



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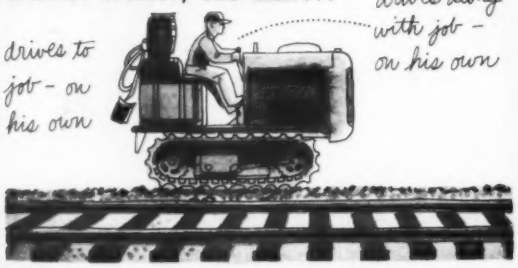

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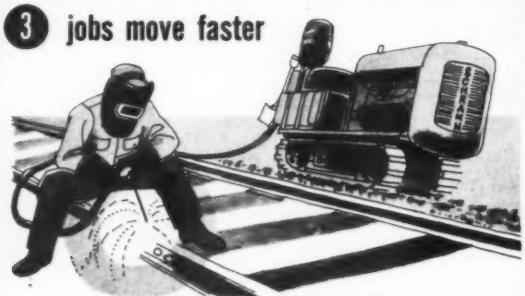

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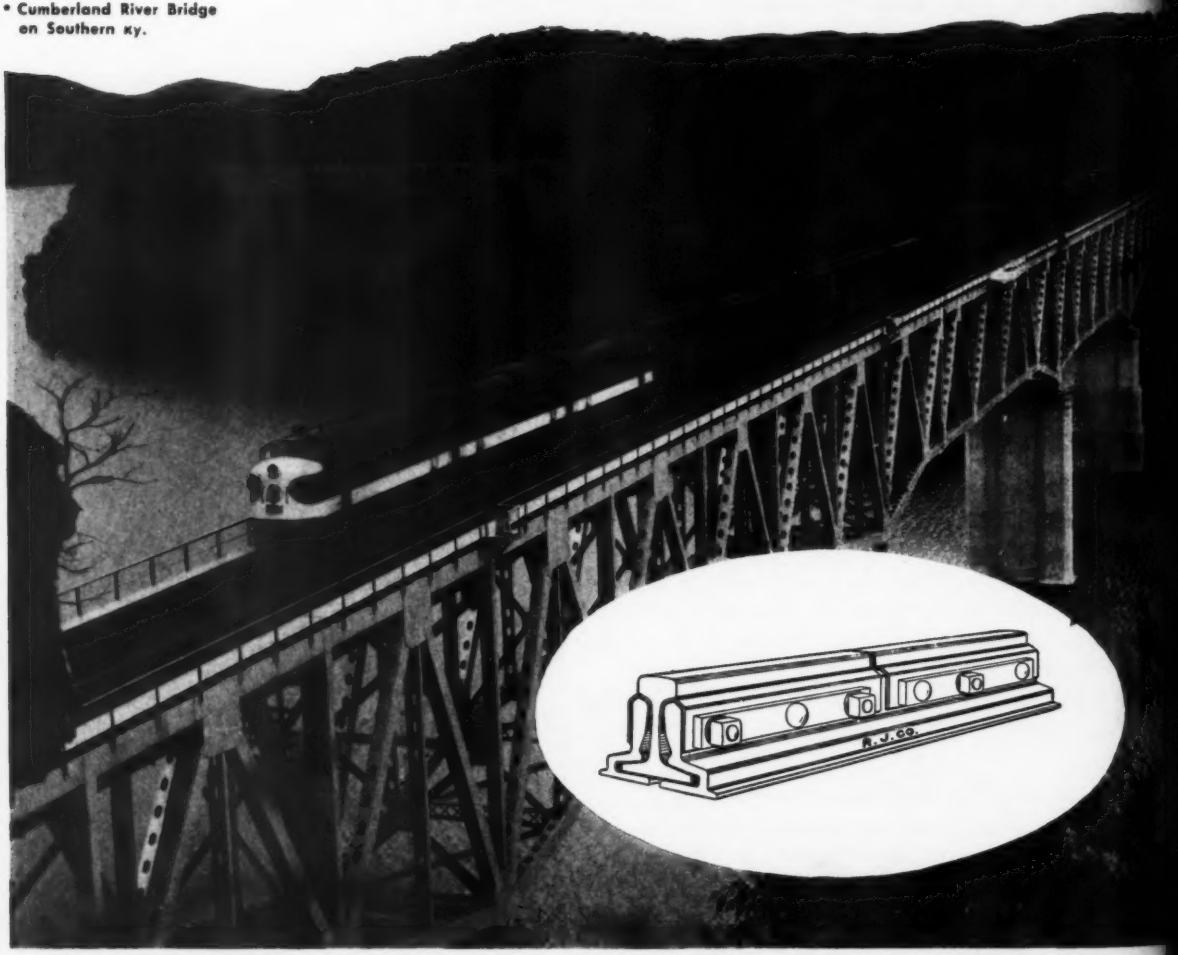
Division of Poor & Company, Inc.

50 Church St., New York 7, N. Y.

• Cumberland River Bridge on Southern Ry.